362

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

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CHEVROLET MODEL 987575

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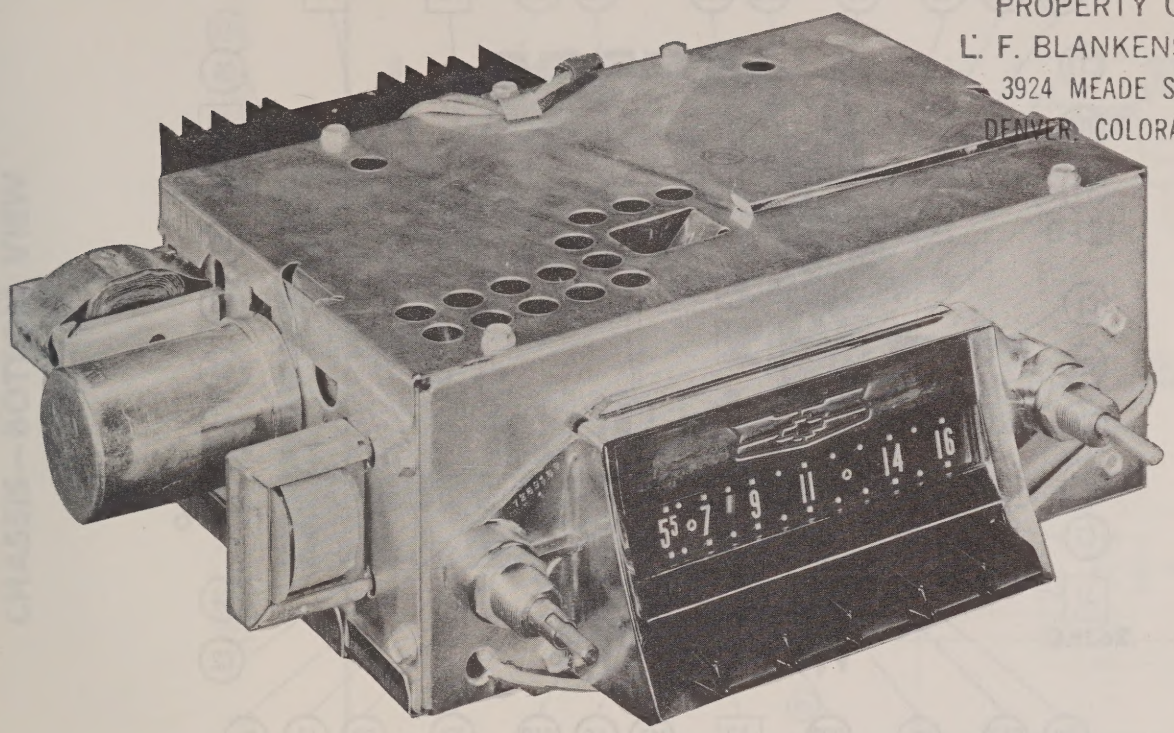
3924 MEADE ST.
DENVER, COLORADO

CHEVROLET
MODEL 987575



CHEVROLET
MODEL 987575

TRADE NAME	Chevrolet Model 987575 (For 1957 Chevrolet Automobiles)
MANUFACTURER	Delco Radio Div., G. M. Corp., Kokomo, Indiana
TYPE SET	Battery Operated Custom Built AM Automobile Receiver With Transistorized Output
TUBES (Five)	Types 12AF6 RF Amplifier, 12AD6 Converter, 12AF6 IF Amplifier, 12F8 Det.-AVC-1st. AF Amp., 12K5 2nd. AF Amplifier
POWER SUPPLY	12 Volt Storage Battery — RATING 1.6 Amp. @ 12.6 Volts DC
TUNING RANGE—BROADCAST	540-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Tone control to treble position.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.1MFD	High side to pin 7 (grid) of 12AD6 (V2) Low side to chassis	262KC (400~ Mod.)	High Freq. end stop	Across voice coil	A1, A2, A3, A4	Adjust for maximum output
	If necessary adjust oscillator core (A8) so that rear of core is 1 5/8" from mounting end of coil form.						
2	68MMF	High side to Ant. receptacle Low side to chassis	1615 KC	"	"	A5, A6, A7, A8	Adjust in order given, A5, A6 & A7 for maximum output
3	"	"	640KC	Tune to 640KC signal	"	A9, A10	Adjust for maximum output
4	"	"	1615KC	High Freq. end stop	"	A6, A7	"
5	"	"	900KC	Tune to 900KC signal	"		If necessary, adjust dial pointer adjustment so that pointer coincides with 1100KC when looking directly at dial
6	With radio installed in car and antenna fully extended, tune in a weak station between 600KC and 1000KC, adjust A7 for maximum volume.						

PUSH BUTTON ADJUSTMENT

1. Pull pushbutton to the left and out.
2. Tune manually to desired station.
3. Press pushbutton in firmly.
4. Repeat on remaining pushbutton.

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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amplifier	12AF6	
V2	Converter	12AD6	
V3	IF Amplifier	12AF6	

ITEM No.	USE	TYPE	NOTES
V4	Det. -AVC- 1st. AF Amp.	12F8	
V5	2nd. AF Amplifier	12K5	

TRANSISTORS

ITEM No.	USE	TYPE	NOTES
X1	Output	2N173	

ITEM No.	USE	TYPE	NOTES

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	DELCO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▬1000	16	7269 719						R2424 *
B	■500	16							
C	▲20	16							

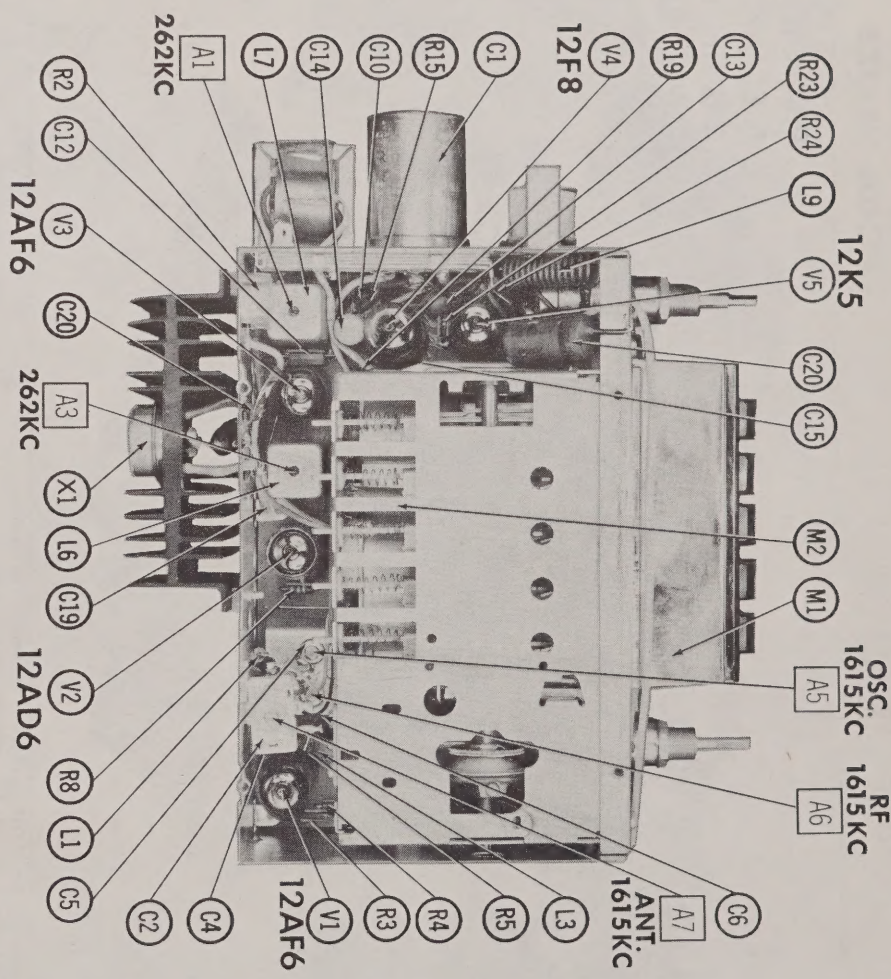
* Non catalog item

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	DELCO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2A	30-100		7268558							
C2B	100									
C3	.047	400	6612	BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	
C4	68		6369	N750-SI68	TCN-68	C10Q68C	TC7-68			N750
C5A			7268479							
C5B										
C5C										
C5D										
C6	39		6366	SI 39	DD-390	L10Q39	ED-39	UC-5439	5GA-Q39	
C7	.047	400	6612	BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	
C8	200		7268904	1469-0002	TCZ-200	22R5T2	TCO-200	MCE237	MS-32	5%
C9	.047	400	6612	BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	
C10	47		6367	BPD-000047	DD-470	L10Q47	ED-47	UC-5447	5GA-Q47	
C11	.0047	400	6631	BPD-0047	D6-472	CUB6D47	GP-4700	GEM-6247	6TM-D47	
C12	47	500	6367	BPD-000047	DD-470	5W5Q47	ED-47	UC-5447	5GA-Q47	
C13	.02	200	6611	BPD-02	DD-203	CUB4S2	ED-02	GEM-412	2TM-S2	
C14	.1	50	6690	P288N-1	DF-104	CUB2P1		GEM-412	2TM-P1	
C15	220		6375	BPD-00022	DD-221	L10T22	ED-220	UC-5322	5GA-T22	
C16	.047	200	6612	BPD-05	DF-503	CUB2S47		GEM-4147	2TM-S47	
C17	.1	100	6690	P288N-1	DD-104	CUB2P1		GEM-401	2TM-P1	
C18	220		6375	SI 220	DD-221	L10T22	ED-220	UC-5322	5GA-T22	
C19	220		6375	SI 220	DD-221	L10T22	ED-220	UC-5322	5GA-T22	
C20	.47	50	6692	P288N-47	CUB2P47			GEM-4047	2TM-P47	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	DELCO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A B C	2Meg 1Meg Switch	½	1220963				UE1776S	Tone Volume, Tap ⓐ 200K
R2	100Ω	2	7269637		39-100		FL-150	Bias Adjust (wire wound)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	DELCO PART No.	IRC PART No.	
R3	1Meg		1235	BTS-1Meg	
R4	1.5Meg		1237	BTS-1.5Meg	
R5	10K		1137	BTS-10K	
R6	15Meg		1249	BTS-15Meg	
R7	680K		1233	BTS-680K	
R8	33K		1217	BTS-33K	
R9	1Meg		1235	BTS-1Meg	
R10	2.2Meg		1239	BTS-2.2Meg	
R11	1Meg		1235	BTS-1Meg	
R12	560K		1232	BTS-560K	
R13	47K		1219	BTS-47K	
R14	1800Ω		1128	BTS-1800	
R15	6.8Meg		1245	BTS-6.8Meg	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	DELCO PART No.	IRC PART No.	
R16	120K		1224	BTS-120K	
R17	2700Ω		1130	BTS-2700	
R18	270K			BTS-270K	Note 1
R19	18K		1214	BTS-18K	
R20	470K		1231	BTS-470K	
R21	39Ω		1108	BTS-39	
R22	15Ω		1103	BTS-15	
R23	390Ω		1120	BTS-390	
R24	120Ω	2	1188	BTB-120	
R25	10Ω		1101	BTS-10	
R26	.47Ω	1	7269709		
R27	150Ω	1		BTA-150	Note 2
R28	82Ω		1112	BTS-82	

Note 1. 220K used in some versions (Part #1227).
Note 2. 150Ω, 2W used in some versions (Part #1189).

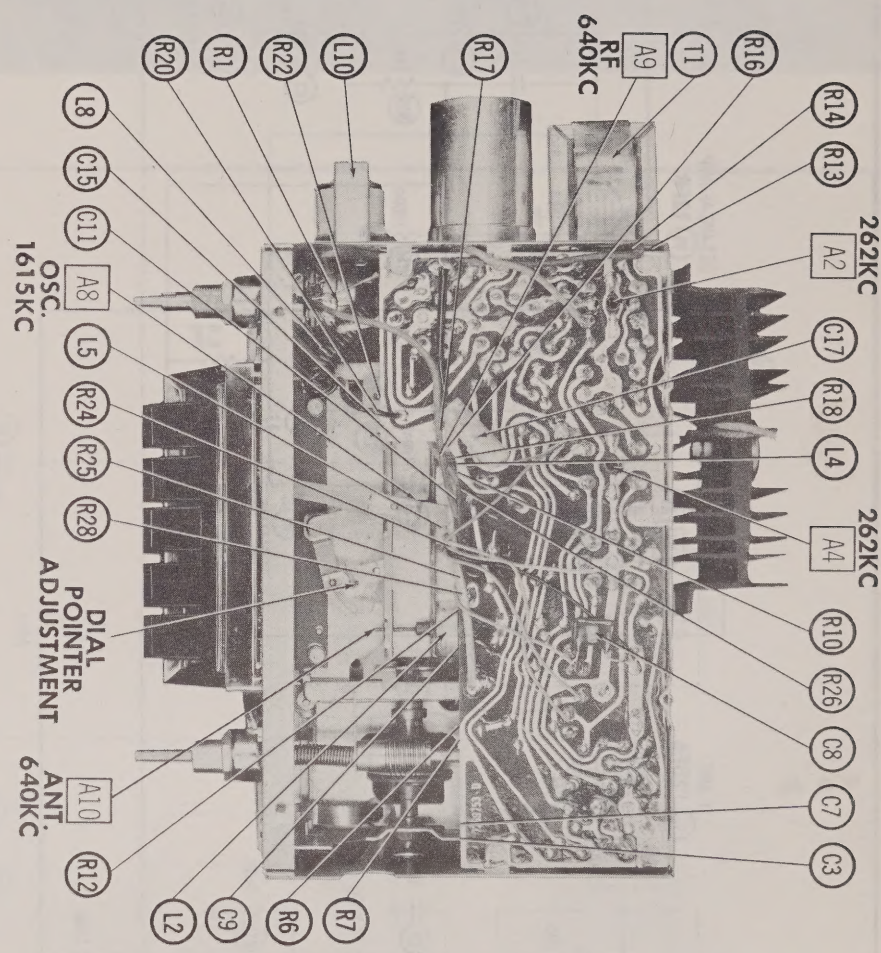
TRANSFORMER (AUDIO INPUT)

ITEM No.	Turns Ratio		REPLACEMENT DATA						NOTES
	PRI.	SEC.	DELCO PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	50:	1	7269877						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	DELCO PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	9Ω	3-4Ω	7269870						

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	DELCO PART No.	QUAM PART No.	
SP1	6"X9"	PM	3-4Ω	1221045	69A2	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		DELCO PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coupling Coil	7255738	19-1004	BC-565	4610	6.5 Microhenries
L2	Ant. Coil	1221050				
L3	RF Choke	7268195				
L4	RF Coil	1221050				
L5	Osc. Coil	1221052				
L6	Input IF	1221015			13-PH1	
L7	Output IF	1221021				
L8	Fil. Choke	1217846				1.3 Microhenries
L9	Hash Choke	1217846				1.3 Microhenries

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∿)	DELCO PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L10	.600A	.24Ω	3 Millihenries	7269881					

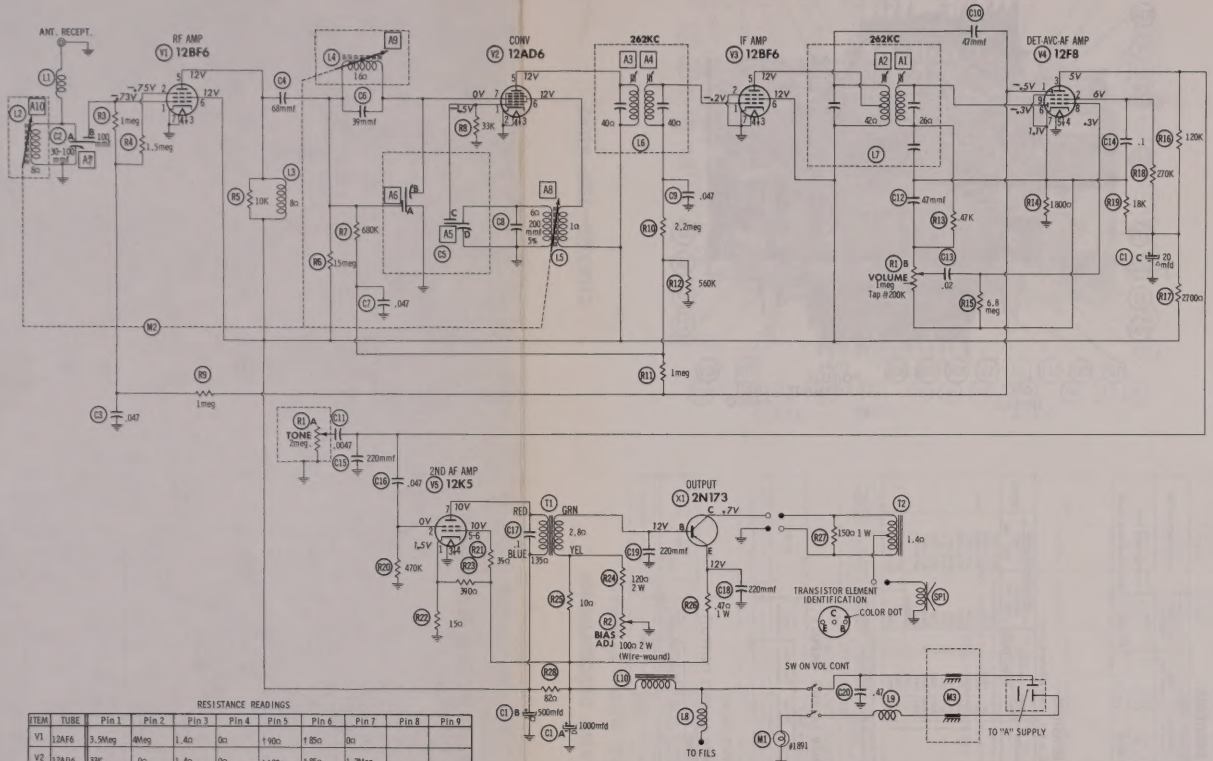
MISCELLANEOUS

ITEM No.	PART NAME	DELCO PART No.	NOTES
M1	Dial Light	456985	#1891
M2	Tuner		
M3	Spark Plate	1220885	Dual Unit
	Printed Board	7269753-D	
	Knob	7268744	Tone, Dummy
	Knob	1990863	Tuning
	Knob	1990864	On-off-volume
	Pushbutton	1220984	5 used
	Pointer Assy.	1221033	

TRANSISTOR BIAS ADJUSTMENT (R2)

The transistor bias control (R2) should be adjusted when the transistor is replaced. The following procedure may be employed.

1. Insert a milliammeter in series with the transistor collector terminal.
2. Connect the receiver to a supply source of 12 volts DC.
3. With the receiver in operation, adjust R2 for a reading of 930 milliampers on the meter.



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AF6	3.5Meg	4Meg	1.4Ω	0Ω	†90Ω	†85Ω	0Ω		
V2	12AD6	33K	0Ω	1.4Ω	0Ω	†120Ω	†85Ω	1.2Meg		
V3	12AF6	2.7Meg	0Ω	1.4Ω	0Ω	†100Ω	†85Ω	0Ω		
V4	12F8	1.5Meg	†272K	†122K	1.4Ω	0Ω	1Meg	1800Ω	6.8Meg	1800Ω
V5	12K5	15Ω	470K	0Ω	1.4Ω	†39Ω	†39Ω	†220Ω		
	TYPE	BASE	COLLECTOR	EMITTER						
X1	2N173	†13Ω	1.2Ω	†.5Ω						

† MEASURED FROM CIA.

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Battery voltage maintained at 12.6 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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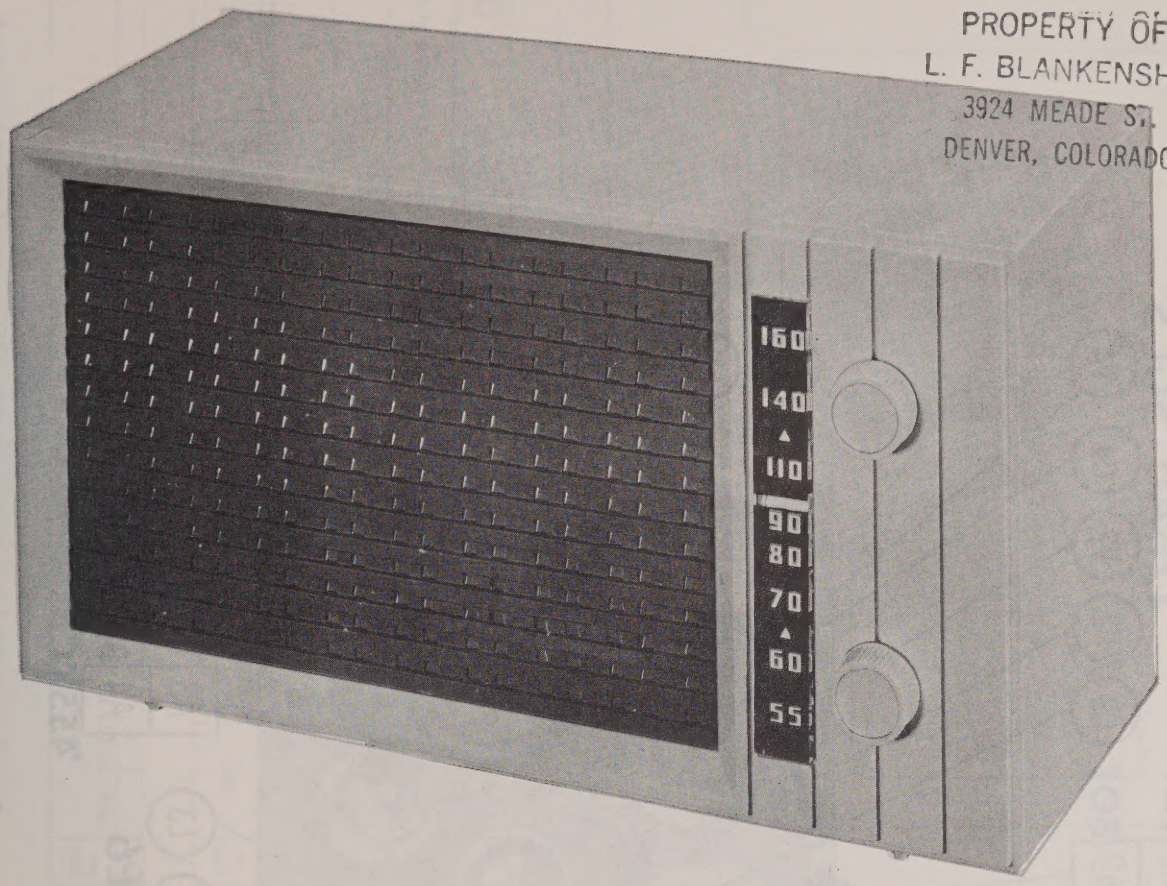
FIRESTONE
MODEL 4-A-159 (Code 382-6-403)



FIRESTONE
MODEL 4-A-159 (Code 382-6-403)

TRADE NAME	Firestone Model 4-A-159 (Code 382-6-403)
SUPPLIER	Firestone Tire & Rubber Co., 1200 Firestone Parkway, Akron, Ohio
TYPE SET	AC-DC Operated AM Receiver
TUBES (Five)	Types 12BE6 Converter, 12BA6 IF Amplifier, 12AV6 Det-AVC-AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-DC — RATING .25 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	535KC-1670KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.
To set pointer, turn tuning capacitor fully closed and set pointer parallel with base of dial.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01MFD	High side to pin 7 (grid) of 12BE6 (V1). Low side to B-.	455KC (400~ Mod)	Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.		Loop	1670KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	Tune to 1400KC signal.	"	A6	"
4.		"	600KC	Tune to 600KC signal.	"	A7	Adjust for maximum output while rocking tuning gang.

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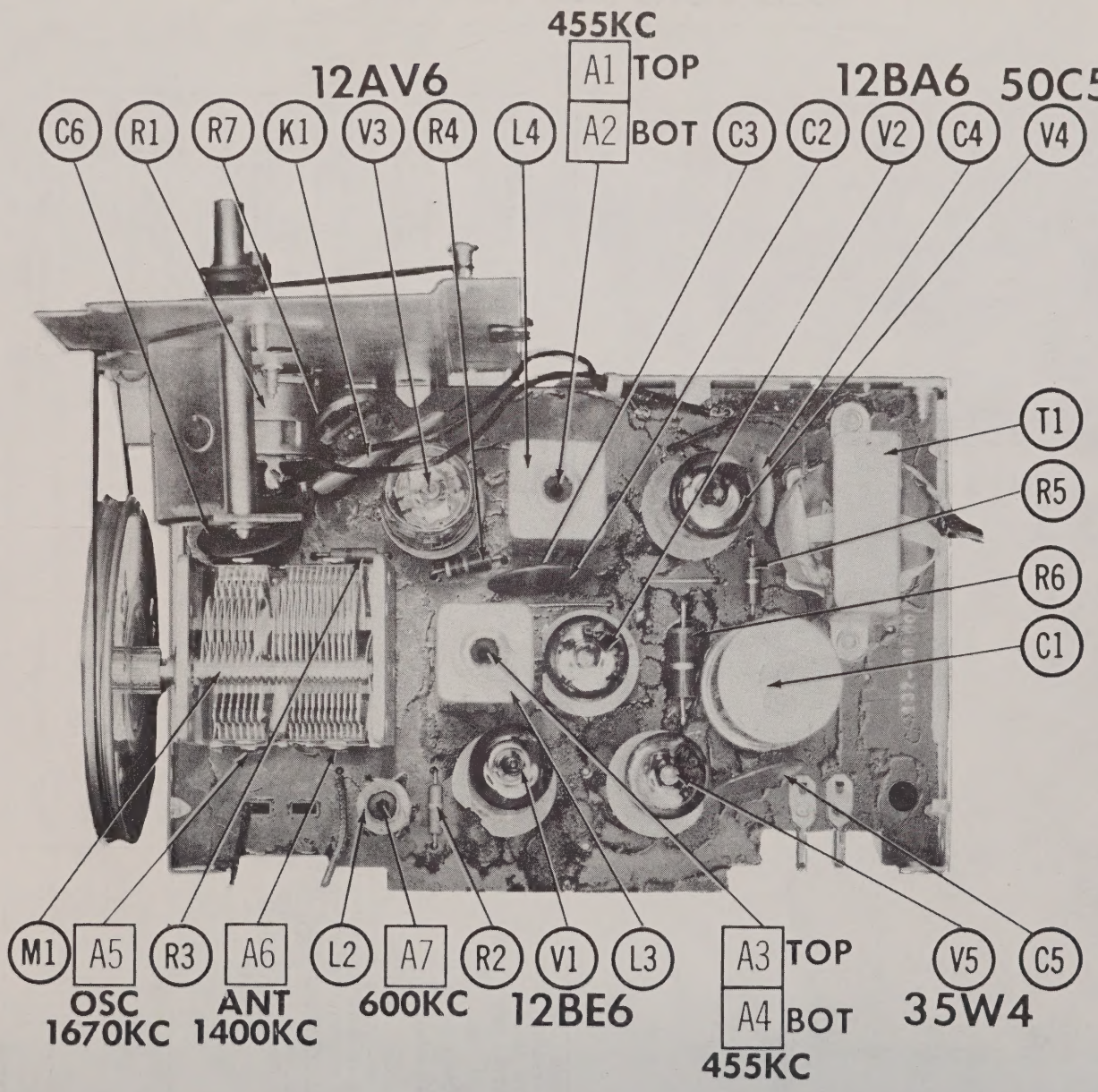


CHASSIS TOP VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Converter	12BE6	
V2	IF Amplifier	12BA6	
V3	Det-AVC-AF Amp.	12AV6	
V4	Output	50C5	
V5	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA FIRESTONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	■50	150	43672	AFH2-15	BO150	FP213	TMD-12	D065	TVL-2432
B	▲30	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA FIRESTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	20000			BPD-02	DD-203	K085	ED-02		5HK-S2
C3	150			BPD-00015	DD-151	G046	ED-150	UC-5315	5GA-T15
C4	10000			BPD-01	DD-103	K082	ED-01	DC511	5HK-S1
C5	20000			BPD-02	DD-203	K085	ED-02		5HK-S2
C6	20000			BPD-02	DD-203	K085	ED-02		5HK-S2

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA FIRESTONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1	500K	½	43745					Volume & Switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA FIRESTONE PART No.	REPLACEMENT DATA IRC PART No.	NOTES
R2	22K			BTS-22K	
R3	2.2Meg			BTS-2.2Meg	
R4	47K			BTS-47K	
R5	120Ω			BTS-120	
R6	1200Ω	1		BTA-1200	
R7	330K			BTS-330K	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA FIRESTONE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	2900Ω	3-4Ω	42700-13	Z1004 ①	A-3025	A-3332	26S58 ①	S-12X	① Fabricate mtg.

PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C. IMP.	REPLACEMENT DATA FIRESTONE PART No.	REPLACEMENT DATA QUAM PART No.	NOTES
SP1	4"	PM	3-4Ω	43804	5A07	

COILS (RF-IF)

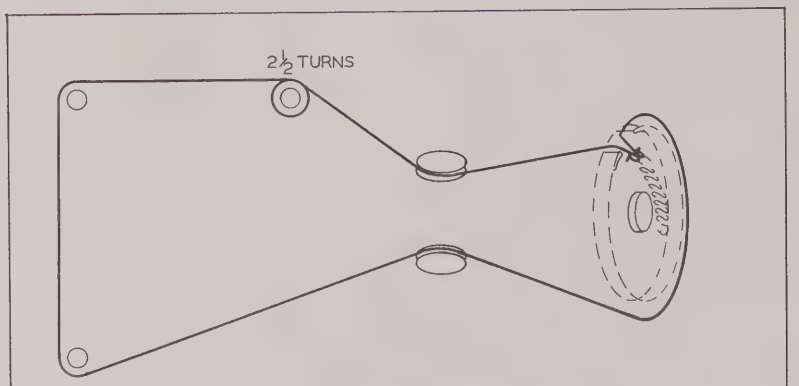
ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA FIRESTONE PART No.	REPLACEMENT DATA MEISSNER PART No.	REPLACEMENT DATA MERIT PART No.	REPLACEMENT DATA MILLER PART No.	NOTES
L1	Loop Ant.	3.3Ω		43768-3				Includes Cabinet Back
L2	Osc. Coil	.4Ω	5Ω	43644-1				
L3	Input IF	16Ω	16Ω	43669-1				
L4	Output IF	16Ω	16Ω	43669-1				

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	FIRESTONE PART No.	REPLACEMENT DATA
K1	Audio Circuit	6.8Meg, 470K, 470K, 220MMF, 250MMF, 5000MMF, 5000MMF	43743-1	Aerovox PA-512 Centralab PC-158 Sprague DT-5

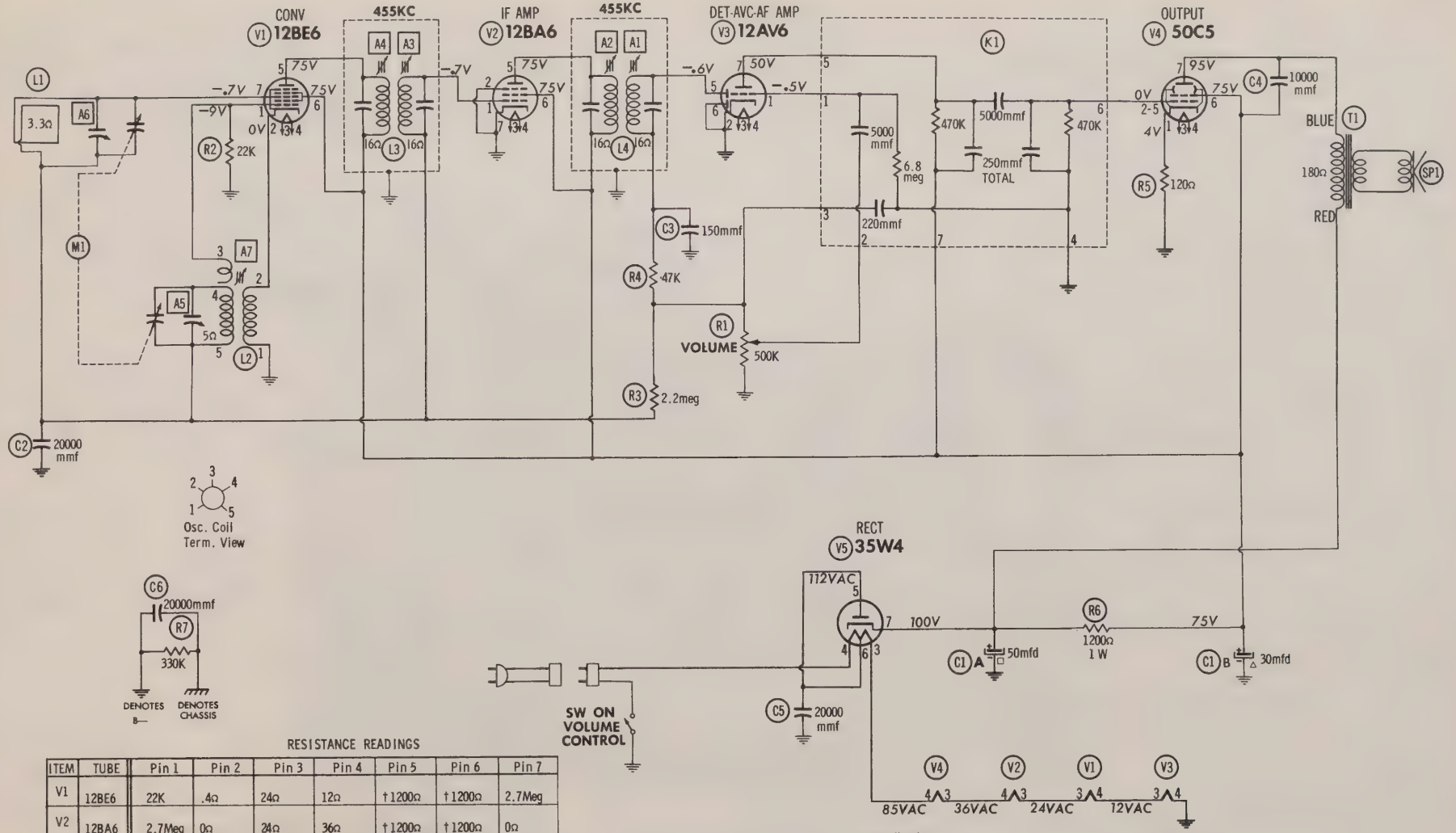
MISCELLANEOUS

ITEM No.	PART NAME	FIRESTONE PART No.	NOTES
M1	Tuning Cap.	43987	2 Gang
	Dial Crystal	43685	
	Printed Board	43743-1	
	Pointer	43748	
	Knob	43736-3	Volume & tuning, Apple green
	Knob	43736-5	Volume & tuning, Cocoa brown
	Cabinet	43182-3	Apple green
	Cabinet	43182-5	Cocoa brown



TUNING GANG FULLY CLOSED

DIAL CORD STRINGING



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BE6	22K	.4Ω	24Ω	12Ω	†1200Ω	†1200Ω	2.7Meg
V2	12BA6	2.7Meg	0Ω	24Ω	36Ω	†1200Ω	†1200Ω	0Ω
V3	12AV6	6.8Meg	0Ω	12Ω	0Ω	550K	0Ω	†470K
V4	50C5	120Ω	470K	36Ω	85Ω	470K	†1200Ω	†180Ω
V5	35W4	NC	NC	85Ω	115Ω	105Ω	105Ω	50K

† MEASURED FROM PIN 7 OF V5.
NC NO CONNECTION.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to commom negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

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PHOTOFACT* Folder

*TRADE MARK

FIRESTONE MODEL 13-G-210
(Code 280-6-17T25)

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FIRESTONE MODEL 13-G-210
(Code 280-6-17T25)

TRADE NAME	Firestone Model 13-G-210 (Code 280-6-17T25)
SUPPLIER	Firestone Tire & Rubber Co., 1200 Firestone Parkway, Akron, Ohio
TYPE SET	Television Receiver
TUBES	Fifteen
POWER SUPPLY	105-115 Volts AC, 60 Cycles — RATING 155 Watts, 1.4 Amp. @ 115 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, Video IF 46.75MC, Sound IF 42.25MC (Intercarrier)

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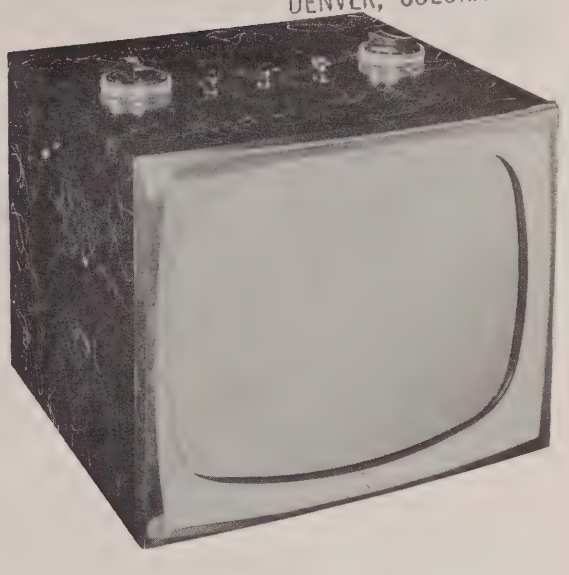
DISASSEMBLY INSTRUCTIONS

CABINET REMOVAL

1. Remove 7 push on type control knobs.
2. Remove 4 metal screws, remove tuner antenna leads, remove rear cover.
3. Place the receiver face down on a pad.
4. Remove 2 metal screws holding AC interlock bracket.
5. Remove 2 speaker leads.
6. Remove 2 metal screws at front of cabinet, one on top, one on bottom.
7. Remove 4 chassis screws from sides of cabinet.
8. Lift cabinet up to remove.
9. Remove 2 speaker bolts, remove speaker.



CAUTION NOTE

ONE SIDE OF AC LINE CONNECTED TO CHASSIS
Care should be exercised when connecting test equipment or physically contacting the chassis.

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF Tuner Oscillator circuit may be accomplished by removal of the Channel Selector and Fine Tuning knobs. The adjustments are accessible, one at a time, through the small hole in the cabinet to the right of the channel selector shaft.

PICTURE TUBE SAFETY GLASS CLEANING

For picture tube safety glass cleaning it is necessary to remove the chassis. (See disassembly instructions)

FOCUS ADJUSTMENT

Adjust the ion trap for best focus consistent with maximum brightness.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

For adjustment of the horizontal oscillator it is necessary to remove the rear cover and supply power to the chassis. Adjustment is located on top of the chassis. Set the horiz. hold control to the center of its range and adjust the horiz. frequency slug (B1) until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate the sound IF detector buzz, adjust the buzz control located on top of the chassis for maximum sound with minimum buzz.

FUSES

A 9.1Ω fusible resistor R83 is used for LV Power Supply protection.

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

ANTI-PIN CUSHION CORRECTION

Reduce the picture size so that the sides of the raster are visible, and position the magnets so that the sides are straight.

FIRESTONE MODEL 13-G-210
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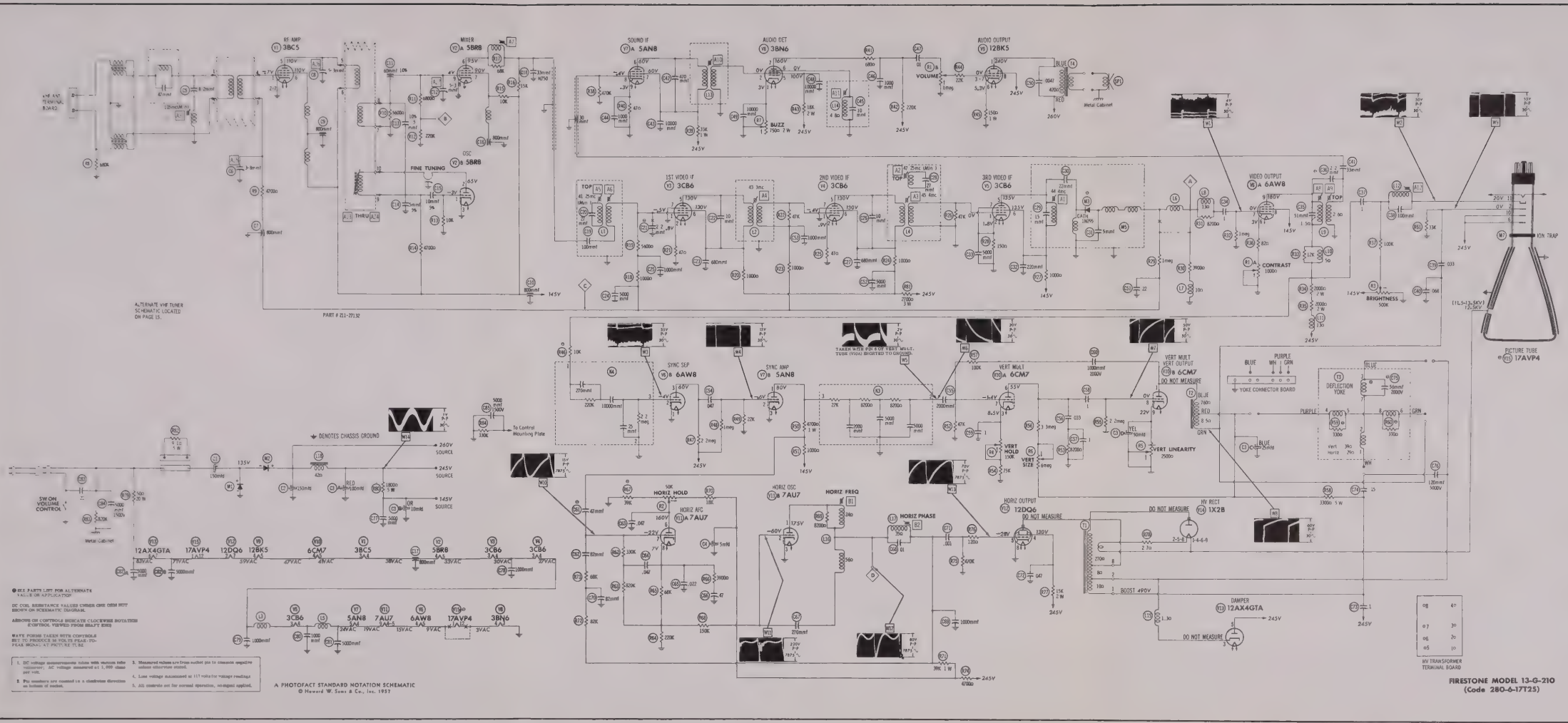
RF AMP V1 3BC5
MIXER V2 5BR8
OSC V2 5BR8
FINE TUNING
THRU
SOUND IF V7 5AN8
AUDIO DET V8 3BN6
AUDIO OUTPUT V9 12BK5
VOLUME
BUZZ
Metal Cabinet
1ST VIDEO IF V3 3CB6
2ND VIDEO IF V4 3CB6
3RD VIDEO IF V5 3CB6
VIDEO OUTPUT V6 A 6AW8
CONTRAST
BRIGHTNESS
ION TRAP
PICTURE TUBE V15 17AVP4
ALTERNATE VHF TUNER SCHEMATIC LOCATED ON PAGE 15.
PART # 21I-27132
SYNC SEP V6 B 6AW8
SYNC AMP V7 B 5AN8
VERT MULT V10 A 6CM7
VERT MULT VERT OUTPUT V10 B 6CM7
DO NOT MEASURE
VERT HOLD
VERT SIZE
VERT LINEARITY
YOKE CONNECTOR BOARD
DEFLECTION YOKE
HORIZ HOLD
HORIZ AFC V11 A 7AU7
HORIZ OSC V11 A 7AU7
HORIZ FREQ
HORIZ PHASE
HORIZ OUTPUT V12 12DQ6
DO NOT MEASURE
HV RECT V14 1X2B
BOOST 490V
DAMPER V13 12AX4GTA
HV TRANSFORMER TERMINAL BOARD
TAKEN WITH PIN 8 OF VERT MULT. TUBE (V10A) SHORTED TO GROUND
To Control Mounting Plate
ON-OFF VOLUME CONTROL
BENOTES CHASSIS GROUND
260V SOURCE
245V SOURCE
145V SOURCE
12AX4GTA 17AVP4 12DQ6 12BK5 6CM7 3BC5 5BR8 3CB6 3CB6
3CB6 5AN8 7AU7 6AW8 17AVP4 3BN6
● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
WAVE FORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE
1. DC voltage measurements taken with vacuum tube voltmeter; AC voltage measured at 1,000 ohms per volt.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings
5. All controls set for normal operation, no signal applied.
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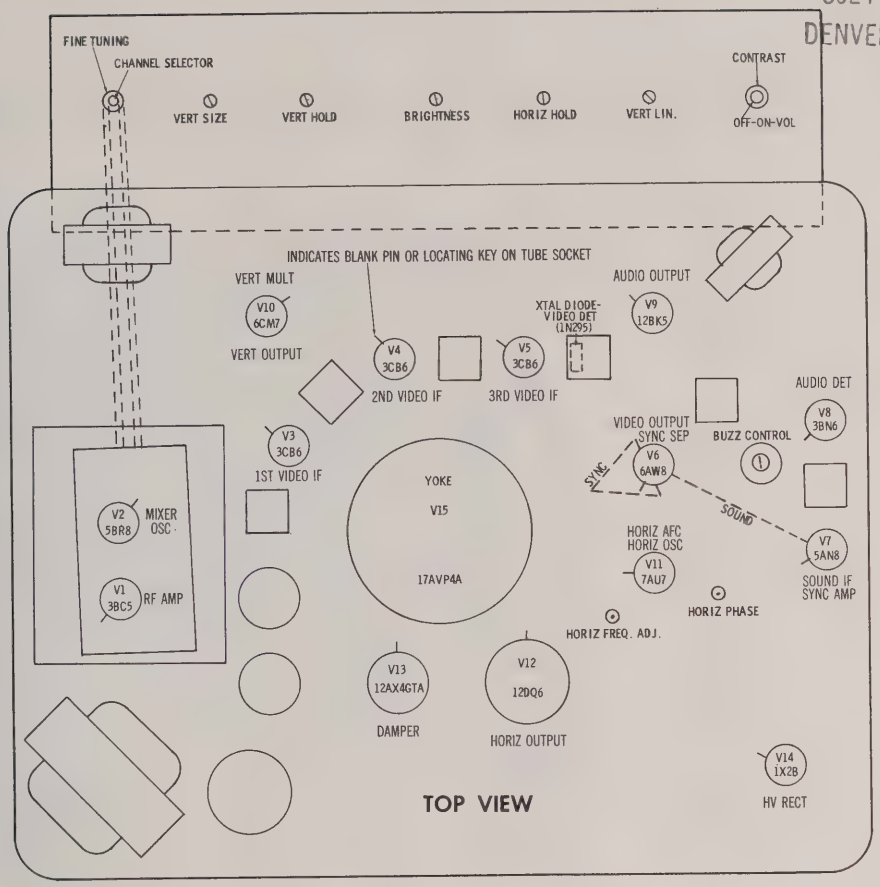
TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

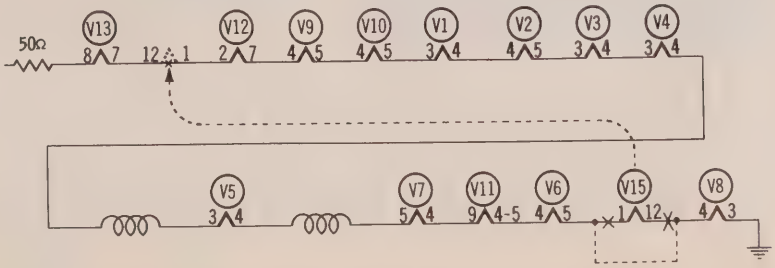
POWER SUPPLY FAILURE
No raster, no sound - **Fusible Resistor (R82), Rectifier (M1, M2)**

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V3, V4, V5, Diode (M3), V6**
No pic, no sound, has snow - **V1, V2, V3**
No pic, has sound, has raster - **V6, V15**
Has pic, no sound - **V7, V8, V9**

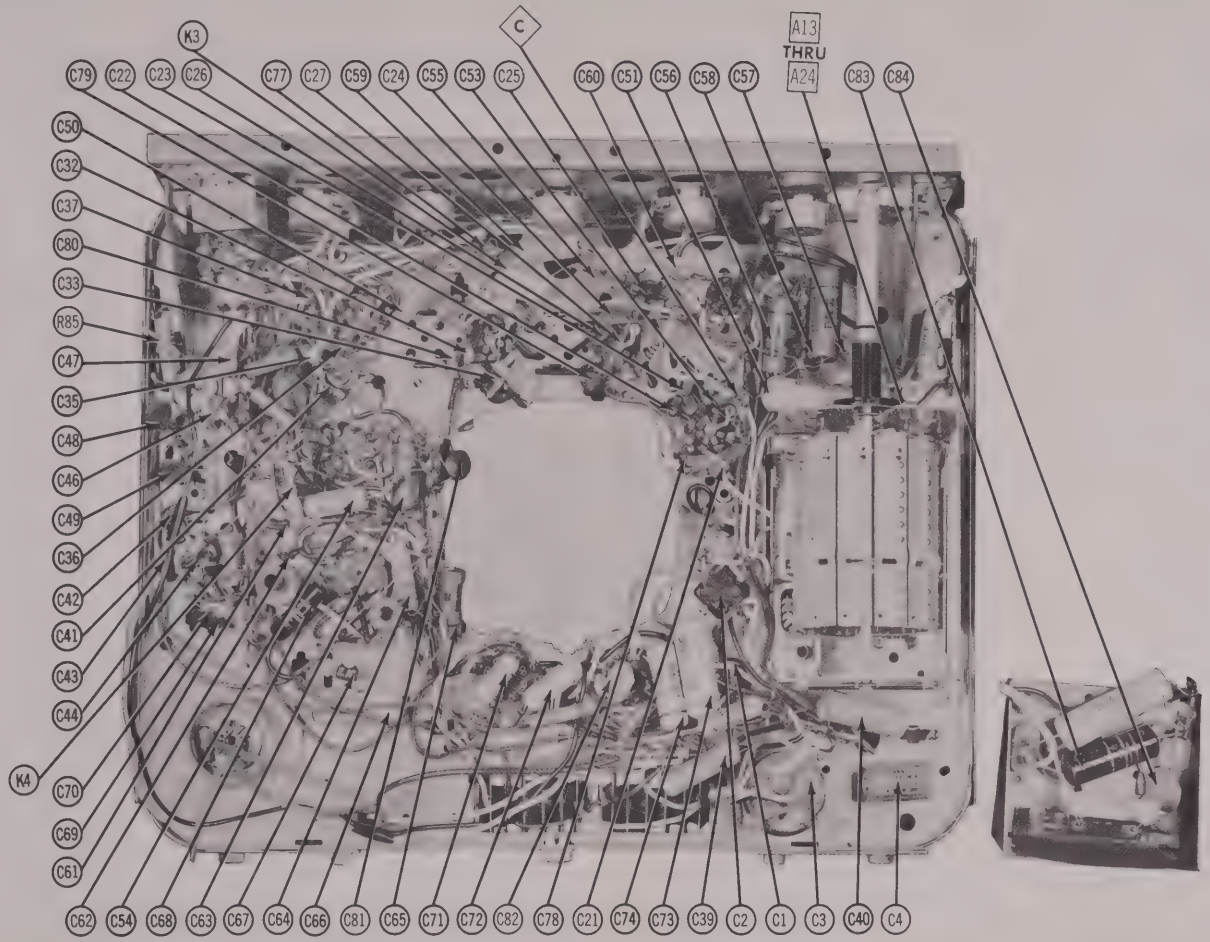
SYNC FAILURE
No vert. sync - **V6, V7, V10**
No horiz. sync - **V6, V7, V11**
No vert. or horiz. sync - **V6, V7**

SWEEP FAILURE
No raster, has sound - **V11, V12, V13, V14, V15**
No vertical deflection - **V10**
Poor vert. linearity or foldover - **V10**
Poor horiz. linearity or foldover - **V11, V12, V13**
Narrow picture - **V11, V12, V13, M1, M2**
Vert. off freq. - **V6, V7, V10**
Horiz. off freq. - **V6, V7, V11**

Since this receiver employs tubes used in a series filament network, an open filament on any of the tubes in the series will cause the set to be inoperative. (See circuit diagram below)



SET 362 FOLDER 3



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use an isolation transformer to protect the test equipment.
The high voltage lead should be securely taped and kept away from the chassis.

VIDEO IF ALIGNMENT

Connect a 1000MMF capacitor across the input terminals of the scope.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	1000MMF	High side to pin 1 (grid) of 3CB6 (V3). Low side to chassis.	Not used.	44.4MC (unmod)	4	USE VTVM DC probe thru 10K to point (A). Low side to chassis.	A1	Use only enough generator output to provide usable indication on VTVM. Adjust for maximum deflection.
2.	"	"	"	48.22MC	"	"	A2	Adjust for MINIMUM deflection.
3.	"	"	"	45.4MC	"	"	A3	Use only enough generator output to provide usable indication on VTVM. Adjust for maximum deflection. Repeat step 2.
4.	"	"	"	43.3MC	"	"	A4	Use only enough generator output to provide usable indication on VTVM. Adjust for maximum deflection.
5.	"	"	44.0MC (10MC Swp)	42.65MC 46.75MC	"	Vert. amp thru 10K to point (A). Low side to chassis.		Use only enough sweep generator output to provide usable pattern on scope. Check for response similar to Fig. 1. If necessary, retouch A1, A3 and A4 for desired response. Adjust A1 for MINIMUM tilt. A3 affects high frequency side of curve and A4 affects the low frequency side.
6.	Direct	High side to a narrow strip of insulated metal placed between converter tube and tube shield. Low side to chassis.	Not used.	41.25MC	"	USE VTVM DC probe thru 10K to point (A). Low side to chassis.	A5	Use only enough generator output to provide usable indication on VTVM. Adjust for MINIMUM deflection.
7.	"	"	44.0MC (10MC Swp)	42.65MC 46.75MC	"	Vert. amp thru 10K to point (A). Low side to chassis.	A6, A7	Adjust for response similar to Fig. 1. If necessary, SLIGHTLY retouch A1, A3 and A4 for desired response.

SOUND IF ALIGNMENT

Tune in a TV station and adjust the fine tuning control until sound bars just appear in the picture. Adjust A8 slug counter clockwise from the coil turns; then clockwise until the horizontal scanning lines are smooth and continuous. Readjust the fine tuning for the clearest picture and best sound.
Reduce the signal strength at the antenna terminals by using an attenuator or similar device until a hiss similar to super regenerator is heard in the sound. Adjust A1, A10, A11 and the buzz control (R7) for maximum sound and MINIMUM buzz. If the hiss disappears during these adjustments, further reduce the signal until the hiss returns.

VIDEO TRAP COIL ADJUSTMENT

Turn the set on and tune in a TV station. Adjust the fine tuning until sound bars just appear in the picture. Turn A12 fully counter clockwise and then clockwise until the horizontal scanning lines are smooth and continuous.

OSCILLATOR ALIGNMENT

Connect the negative lead of a 1.5 volt bias supply to point (G). Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the center of its range.
Use only enough sweep generator output to provide usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. thru 47K to point (A). Low side to chassis.	A13	Adjust to place sound marker in trap notch as in Fig. 2. Video marker should fall at 50%.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A14	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A15	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A16	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A17	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A18	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A19	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A20	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A21	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A22	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A23	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A24	

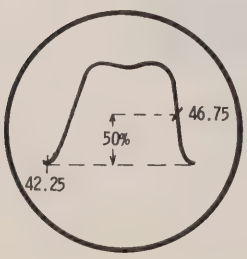


FIG. 1

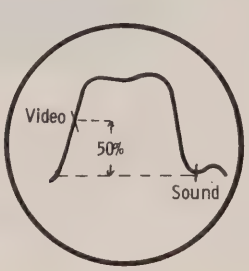


FIG. 2

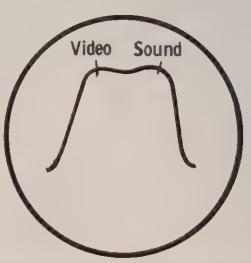


FIG. 3

ALIGNMENT INSTRUCTIONS (cont)

RF AND MIXER ALIGNMENT FOR TUNER PART #211-27132

Connect bias as under "Oscillator Alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
13.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	207MC (10MC Swp)	205.25MC 209.75MC	12	Vert. Amp. thru 10K to point Ⓑ. Low side to chassis.	A25, A26, A27	Adjust for response curve similar to Fig. 3 with markers above 90%.
14.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	13	"		Check for response similar to Fig. 3. If markers fall below 70% on any channel, make compromise adjustments of A25, A26, and A27 with channel switch set to that channel. Check all other channels to see that they have not been seriously affected.
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
			85MC (10MC Swp)	83.25MC 87.75MC	6			
			79MC (10MC Swp)	77.25MC 81.75MC	5			
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			

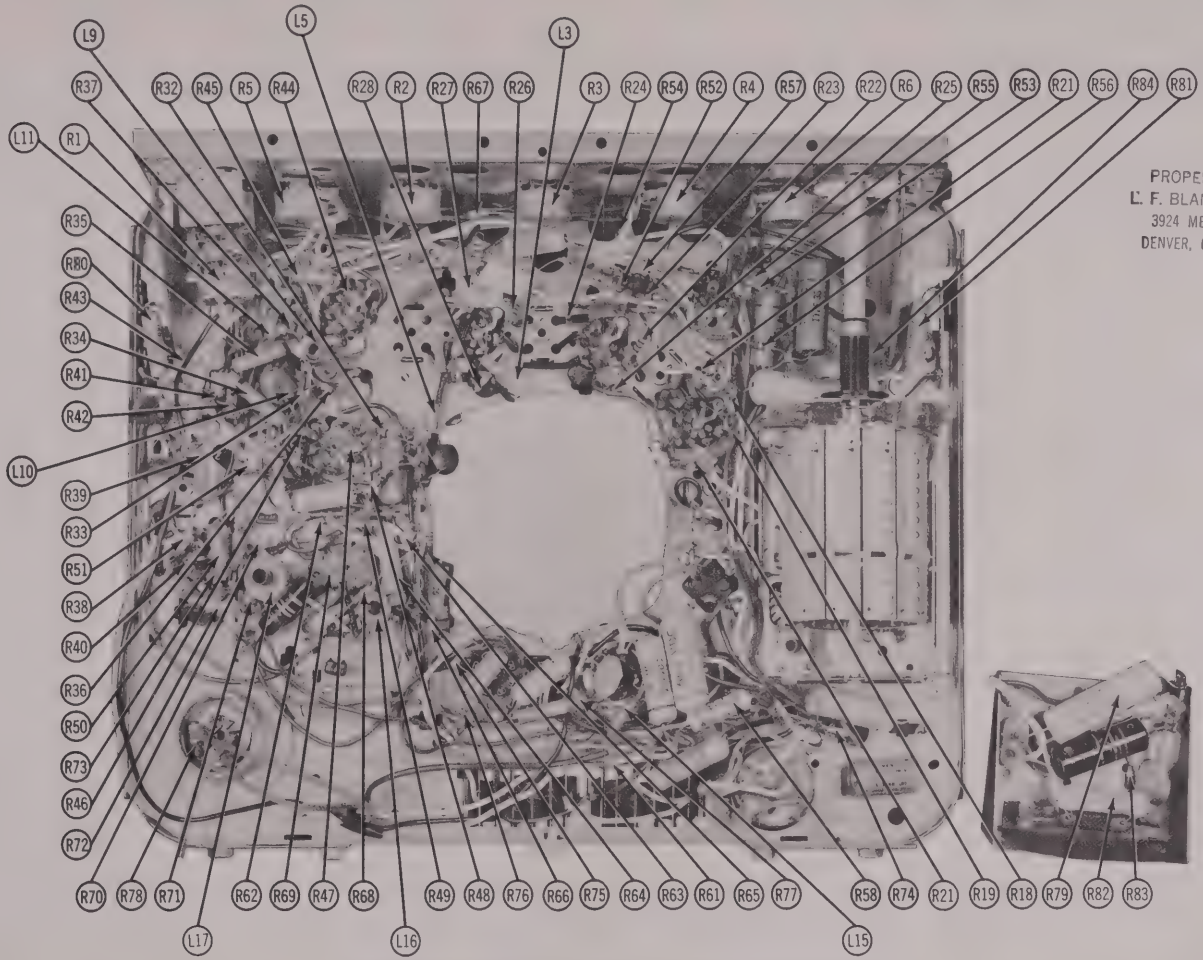
RF AND MIXER ALIGNMENT FOR TUNER PART #211-27255

Connect bias as under "Oscillator Alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
15.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	195MC (10MC Swp)	193.25MC 197.75MC	10	Vert. Amp. thru 10K to point Ⓑ. Low side to chassis.	A28, A29	Adjust A28 and A29 for response similar to Fig. 3 with markers on shoulders of curve.
16.	"	"	"	"	"	"	A30	Adjust for MINIMUM response.
17.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	13	"		Check for response similar to Fig. 3. If markers fall below 70% on any channel, make compromise adjustment of A28 and A29 with channel switch set to that channel. Check all other channels to see that they have not been seriously affected.
			207MC (10MC Swp)	205.25MC 209.75MC	12			
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
			85MC (10MC Swp)	83.25MC 87.75MC	6			
			79MC (10MC Swp)	77.25MC 81.75MC	5			
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			

INTERFERENCE TRAP ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
18.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	105MC	2	High side to point Ⓐ. Common to chassis.	A31	Adjust for MINIMUM deflection.

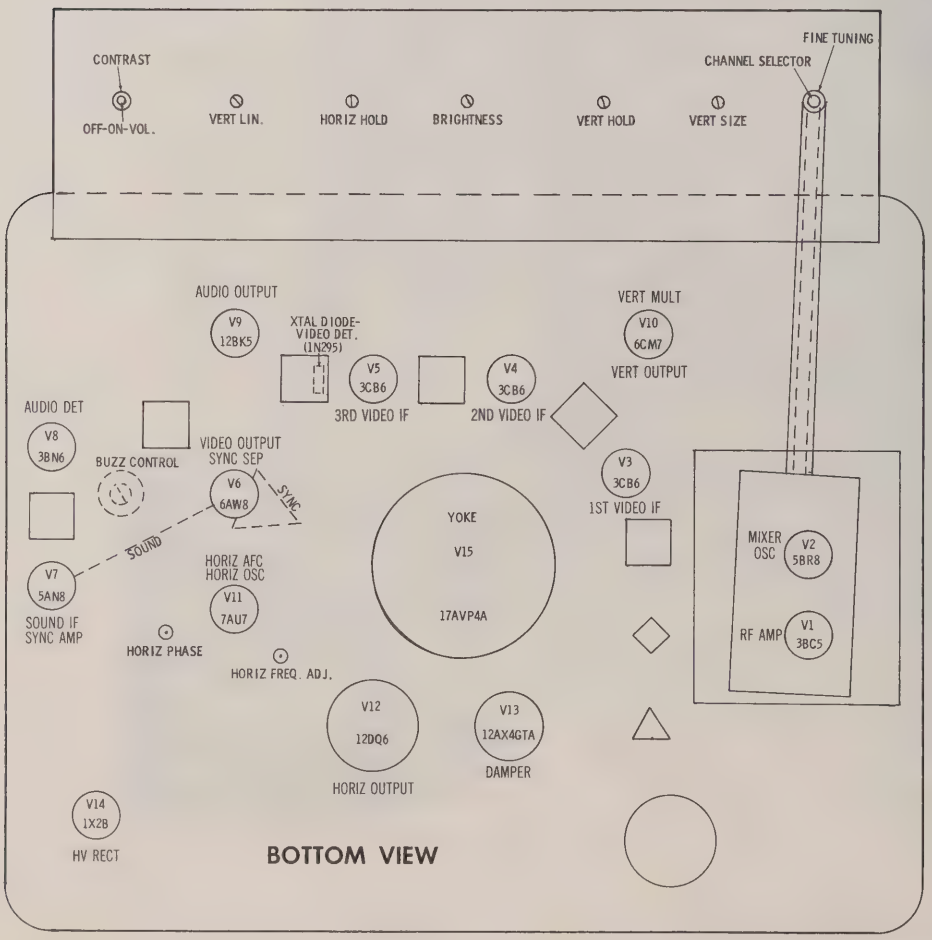


CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

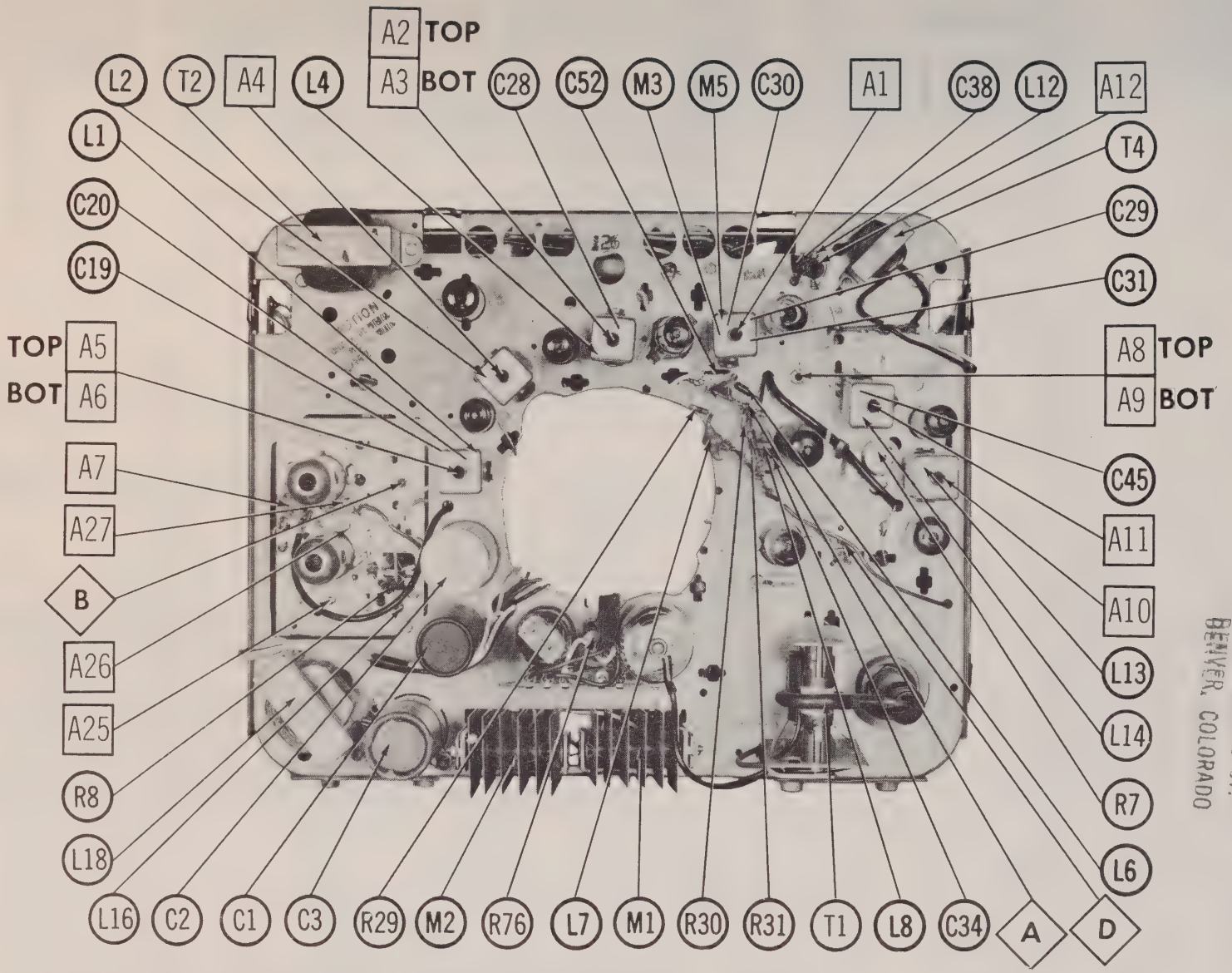
RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	3BC5	1Meg	0Ω	12Ω	11Ω	†1800Ω	†1800Ω	0Ω		
V2	5BR8	10K	†6500Ω	0Ω	11Ω	10Ω	†17K	†12K	0Ω	230K
V3	3CB6	1Meg	47Ω	10Ω	9Ω	†3700Ω	†3700Ω	0Ω		
V4	3CB6	1Meg	47Ω	9Ω	8Ω	†3700Ω	†3700Ω	0Ω		
V5	3CB6	.1Ω	150Ω	8Ω	7Ω	†2800Ω	†2800Ω	150Ω		
V6	6AW8	0Ω	2.2Meg	†2.2Meg	5Ω	3.5Ω	●120Ω	1Meg	†1800Ω	†4000Ω
V7	5AN8	†7500Ω	22K	0Ω	6Ω	7Ω	†33K	†33K	470K	47Ω
V8	3BN6	●320Ω	.3Ω	0Ω	1.5Ω	†18K	4.8Ω	†220K		
V9	12BK5	†420Ω	TP	22K	16Ω	14Ω	150Ω	22K	†42Ω	NC
V10	6CM7	‡3300Ω	NC	●150K	14Ω	12Ω	●‡4Meg	47K	2.2Meg	●1000Ω
V11	7AU7	†45K	370K	0Ω	5Ω	5Ω	●†30K	1.4Meg	290K	6Ω
V12	12DQ6	TP	18Ω	TP	†15K	470K	TP	16Ω	0Ω	TOP CAP ‡9Ω
V13	12AX4GTA	TP	NC	180K	NC	†42Ω	TP	18Ω	21Ω	
V14	1X2B	PINS 1 THRU 9 HAVE INFINITE RESISTANCE								TOP CAP ‡279Ω
V15	17AVP4A	3.5Ω	33K	Pin 6 †42Ω	Pin 10 †42Ω	Pin 11 ●120K	Pin 12 1.5Ω			

† MEASURED FROM OUTPUT OF M2.
‡ MEASURED FROM PIN 3 OF V13.
● THIS READING WILL VARY, CONTROL SET FOR NORMAL OPERATION.
NC NO CONNECTION
TP TIE POINT



TUBE PLACEMENT CHART



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DENVER, COLORADO

CHASSIS TOP VIEW

(Code 280-6-17125)

FIRESTONE MODEL 13-G-210

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V1	RF Amp.	3BK5	
V2	Mixer-Osc.	3DK6	
V3	1st Video IF Amplifier	3CB6	
V4	2nd Video IF Amplifier	3CB6	
V5	3rd Video IF Amplifier	3CB6	
V6	Video Output-Sync Sep.	6AW8	
V7	Sound IF Amp.-Sync Amp.	3AN8	
V8	Audio Det.	3BN6	
V9	Audio Output	3BH5	
V10	Vert. Mult.-Vert. Output	6U8A	
V11	Horiz. AFC-Horiz. Osc.	7AU7	
V12	Horiz. Output	12DQ6	
V13	Damper	12AX4GTA	
V14	HV Rectifier	1X2B	

PICTURE TUBE

ITEM No	REPLACEMENT DATA				NOTES
	FIRESTONE PART No.	CBS PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	
V15	17AVP4	17AVP4	17AVP4	17AVP4	Aluminized
	17AVP4A	17AVP4A	17AVP4A	17AVP4A	Silver Screen "85"

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT	FIRESTONE PART No.	AEROVOX PART No.	CORNELL DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	150	150	RC-2264	AT3A3-23	XA3J3-5	FP317	TM3-25	T-250	TVL-1429
C2	150	300	RC-3712	AT3K3-37-25	BG370	FP331	TM3-42	S-300	TVL-1564
C3A	400	300	RC-35309	AF8H-1158-80	DGT68	WQ633	TMQ-155	T-527 MTD-4530	TVL-4703.5
B	30	300							
C	25	450							
D	50	50							
C4	3	300	RC-34174	PRS350V4	BR435	TC60	TD-8-350	FM-3508	TVA-1801

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	FIRESTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C5	8.2			MPO-DE 8.2		ED16	MPGA-8K2			
C6	3-8				829-10					
C7	800						3115-01-GN5	CT565A		
C8	5-3				829-3					
C9	900									
C10	600									
C11	60						3115-01-GN5	CT565A		10%
C12	5-3				829-3					10%
C13	5			TCZ-R5						5%
C14	10									5%
C15	10									
C16	600									
C17	600									NT50
C18	33			NT50-S1 100	TCM-100	C10T1U	TCT-100	NT-S31	STCU-T1	
C19	109			346T-00003T		SW542T		MS-427		
C20	37			MPO-SI 2.2	TCZ-2R2	C10Y3C	TCO-2.2		STCCB-V22	Note 1
C21	2.2			NT50-S1 10	TCM-10	C10QU	TCT-3T	NT-S41	STCU-Q1	
C22	680			BPD-00068	DD-681	BYA10T68	SGA-680	UC-5368	SGA-T68	
C23	5000			BPD-0050	DD-502	BYA10D5	GP-5000	DC525	SHK-D5	
C24	1000			BPD-001	DD-102	BYA5DI	ED-1000	DC521	SHK-D1	
C25	10			NT50-S1 10	TCM-10	C10QU	TCT-4D	NT-S41	STCU-Q1	
C27	680			BPD-00068	DD-681	BYA10T68	ED-680	UC-5368	SGA-T68	
C28	6800			346S-00027		SB542T		MS-427		
C29	15			NT50-S1 15	TCM-15	C10QI5U	TCT-1S		STCU-Q25	
C30	33			NT50-S1 33	TCM-33	C10QI3U	TCT-2J		STCU-Q22	
C31	15			MPO-SI 5	TCZ-5	C10Y5C	TCO-5	ZT-555		
C32	330			BPD-00033	DD-371	LU373	ED-330	UC-5322	SGA-T32	
C33	5000			BPD-005	DD-502	BYA10D5	GP-5000	DC535	SHK-D5	
C34	1	300		P348M-1		DP-104	CUB3P1	GEM-301	2TM-P1	
C35	51			MPO-SI 5.2	TCZ-5.2	C10Y3ZC	TCO-5.2		STCCB-V22	Note 2
C37	1.5			P348M-1		DP-104	CUB4P1	GEM-401	4TM-P1	
C38	600	600		BPD-0001	DD-381	LJ371	ED-100	UC-531	SGA-T1	
C39	.033	600		BPD-03	DP-304	CUB6S3		GEM-6133	6TM-S33	
C40	.068	600		P668M-068		DP-304		GEM-6168	6TM-S68	
C41	33			MPO-SI 33	TCZ-33	C10Q33C	TCO-33	ET-5433	STCC-Q33	
C43	470			BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	SGA-T47	
C44	1000			BPD-001	DD-102	BYA5DI	ED-1000	DC521	SHK-D1	
C44	1000			BPD-001	DD-102	BYA5DI	ED-1000	DC521	SHK-D1	
C45	10									
C46	500			BPD-001	DD-102	BYA5DI	ED-1000	DC521	SHK-D1	
C47	.02	600		BPD-02	DP-303	CUB4S1		GEM-411	4TM-S1	
C49	10000			BPD-01	DD-103	BYA8SI	GP-10000	DC531	SHK-S1	
C49	10000			BPD-01	DD-103	BYA8SI	GP-10000	DC531	SHK-S1	
C50	.0047	600		BPD-0047	DP-304	CUB6S47		GEM-6147	6TM-D47	
C51	.33	300		P338M-33	DD-330	CUB2P33		GEM-3033	2TM-P22	
C52	5000			BPD-05	DD-503	BYA10D5	GP-5000	DC535	SHK-D5	
C53	1000			BPD-01	DD-102	BYA5DI	ED-1000	DC521	SHK-D1	
C54	.047	600		BPD-05	DP-303	CUB4S47		GEM-4147	4TM-S47	
C55	5000			BPD-05	DD-503	BYA10D2	GP-3000	DC522	SHK-D2	
C56	.033	600		BPD-03	DP-303	CUB4S33		GEM-4133	4TM-S33	
C57	.1	300		P348M-1	DP-104	CUB4P1		GEM-401	2TM-P1	
C58	1	600		P348M-1	DP-104	CUB4P1		GEM-401	4TM-P1	
C59	.1	600		P348M-1	DP-104	CUB4P1		GEM-401	2TM-P1	
C60	1800	3000	8G-34908	BVD-30-100	BVD30-102	HVB30DI	HD3-1000	DC3021	20GA-D1	
C61	47			BPD-00047	DD-470	LJ0Q47	ED-47	UC-5447	SGA-Q47	Note 3
C62	47			BPD-00047	DD-470	LJ0Q47	ED-47	UC-5447	SGA-Q47	
C63	.047	600		BPD-05	DP-503	CUB4S47		GEM-4147	4TM-S47	
C64	.047	600		BPD-05	DP-503	CUB2S47		GEM-2147	2TM-S47	
C65	.022	300		BPD-02	DP-303	CUB2S22		GEM-2122	2TM-S22	
C66	.47	300		P348M-47	DP-470	CUB2P47		GEM-2047	2TM-P47	
C67	370			BPD-00037	DD-371	L0T37	ED-370	UC-5327	SGA-T27	
C68	.01	600		BPD-01	DP-103	CUB6S1		GEM-611	6TM-S1	
C69	1000			BPD-001	DD-102	BYA5DI	ED-1000	DC521	SHK-D1	
C70	82	500		BPD-00082	DD-820	LJ0Q82	ED-82	UC-5462	SGA-Q482	
C71	.001	600		BPD-001	DD-102	CUB6D1		GEM-621	6TM-D1	
C72	.047	400		BPD-05	DP-503	CUB4S47		GEM-4147	4TM-S47	
C73	.1	300		P348M-1	DP-104	CUB4P1		GEM-401	4TM-P1	
C74	.1	300		P348M-15		CUB2P15		GKM-2015	2TM-P15	
C75	5%	2000								Note 4
C76	120	5000	8G-35335							
C77	5000			BPD-005	DD-502	BYA10D5	GP-5000	DC525	SHK-D5	
C78	1000			BPD-001	DD-102	BYA5DI	ED-1000	DC521	SHK-D1	
C79	1000			BPD-001	DD-102	BYA5DI	ED-1000	DC521	SHK-D1	
C80	1000			BPD-001	DD-102	BYA5DI	ED-1000	DC521	SHK-D1	
C81	5000			BPD-005	DD-502	BYA10D5	GP-5000	DC525	SHK-D5	

ITEM No	RATING		REPLACEMENT DATA						NOTES
	CAP	VOLT	FIRESTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C82A	5000			BPD-2X0047	DD3-502	DYD5DD5	GP-5000	DC535	SHK-X2D47	
B	5000						GP-5000	DC525		
C83	.22	400		P488N-22		CUB4P22		GEM-4033	4TM-P22	
C84	5000	1500	8G-22612	HVD-15-4700		HVC15D47	MD5-4700	GEM-4535	15TM-D5	
C85	5000	1500	8G-22612	HVD-15-4700		HVC15D47	HD5-4700	GEM-4535	15TM-D5	

Note 1: Not used in some versions.
Note 2: Some versions may use a 3.3MMF in this application.
Note 3: Some versions may use an 82MMF in this application.
Note 4: Some versions may use a 47MMF in this application.

CONTROLS

ITEM No	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	FIRESTONE PART No	CENTRALAB PART No	CLAROSTAT PART No	IRC PART No	MALLORY PART No	
R1A	1000Ω	½	10A-33714	F1-4	RTV-468	UF13L	UF13L	Contrast Volume
B	1Meg	½		RS-23	Not Req.	UR46A	UR46A	
C	Switch			KB-1	Not Req.	UB-38		
R2A	50K	½	10B-33694	AB-31	A47-50K-S	QU-153	TA84L	Horiz. Hold
B	Shaft			AK-4	RSB-3	Not Req.	Not Req.	
R3A	500K	½	10B-33605	AB-39	A47-500K-S	QU-133	TA83L	Brightness
B	Shaft			AK-4	RSB-3	Not Req.		
R4A	150K	½	10B-33683-1	AB-43	A47-150K-S	QU-338	TA184L	Vert. Hold
B	Shaft			AK-4	KB6-3	Not Req.	Not Req.	
R5A	25000Ω	½	10B-37597					Vert. Lin. With stop.
B	Shaft							
R6A	4Meg	½	10B-37598					Vert. Size
B	Shaft							
R7	750Ω	2	10D-33657		39-78Ω			Buss (Wire-wound)

* Concentrikit Equivalent, Kit K-6, Base Elements & Shafts, B1T-108, P1T-102 (Panel)
B2S-137, R3-115 (Rear)
76-1 Switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	FIRESTONE PART No	IRC PART No.	
R9	680K			BTS-680K	
R10	470Ω			BTS-470	
R11	560Ω			BTS-560	
R11	4700Ω			BTS-4700	
R13	220K			BTS-220K	
R13	10K			BTS-10K	
R14	4700Ω		BYA10T47	SGA-T47	
R15	10K			BTS-10K	
R16	15K			BTS-15K	
R17	68K			BTS-68K	
R18	1000Ω			BTS-1000	
R19	5600Ω			BTS-5600	
R20	1000Ω			BTS-1000	
R21	47Ω			BTS-47	
R22	47K			BTS-1000	
R23	1000Ω			BTS-1000	
R24	1000Ω			BTS-1000	
R25	47Ω			BTS-47	
R26	47K			BTS-47K	
R27	1000Ω			BTS-1000	
R28	150Ω			BTS-150	
R29	1Meg			BTS-1Meg	
R30	3900Ω			BTS-3900	
R31	8200Ω			BTS-8200	
R32	1Meg			BTS-1Meg	
R33	12K			BTS-12K	
R34	2000Ω 5%	3		BTS-3000 5%	
R35	2000Ω 5%	3		BTS-3000 5%	
R36	82Ω			BTS-82	
R37	100K			BTS-100K	
R38	470K			BTS-470K	
R39	33K	1		HTA-33K	
R40	47Ω			BTS-47	
R41	680Ω			BTS-680	
R42	8200K			BTS-8200K	
R43	18K	2		BTS-18K	
R44	33K	1		BTS-33K	
R45	100Ω	1		HTA-100	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	FIRESTONE PART No	IRC PART No.	
R46	10K			BTS-10K	Note 1
R47	2.2Meg			BTS-2.2Meg	
R48	1Meg			BTS-1Meg	
R49	22K			BTS-22K	
R50	4700Ω	1		HTA-4700	
R51	1000Ω			BTS-1000	
R52	47K			BTS-47K	
R53	8200Ω			BTS-8200	
R54	75K 5%			BTS-75K 5%	
R55	2.2Meg			BTS-2.2Meg	
R56	3.3Meg			BTS-3.3Meg	
R57	100K			BTS-100K	
R58	3300Ω	5	8C1S-1105	PWT-3300	Note 2
R59	330Ω				Note 3
R60	330Ω				
R61	33K			BTS-33K	
R62	330K			BTS-330K	
R63	680K			BTS-680K	
R64	250K			BTS-250K	
R65	68K 5%				
R66	3900Ω			BTS-3900	
R67	39K				Note 1
R68	150K 5%			BTS-150K 5%	
R69	6800Ω			BTS-6800	
R70	18K			BTS-18K	
R71	39K	1		HTA-39K	
R72	82K			BTS-82K	
R73	68K			BTS-68K	
R74	4700Ω			BTS-4700	
R75	470K			BTS-470K	
R76	1500			BTS-152	
R77	10K	2		BTS-10K	
R78	2.7Ω		BC1-1068	BW1-2.7	
R79	50Ω	20	BC-27077	2D-50	
R80	1800Ω	5	BC12-1D2		
R81	2700Ω	5	BC12-2D2		
R82	9.1Ω	5	46M-3301B		
R83	680K			BTS-680K	
R84	330K			BTS-330K	

Note 1: A 33K resistor is used in some versions.
Note 2: A 150Ω resistor is used in some versions.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No	USE	REPLACEMENT DATA								NOTES
		FIRESTONE PART No.	Halldorson PART No.	Merit PART No.	RCA TYPE No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	Horiz. Output Trans.	12E-27149	FB44B ①	HVO-58*	X138*		HO-250*	FLY-98*	D-83*	
T2	Vert. Output Trans.	12E-27189	21B03 ①	A-3036 ①	V30* ①		A-8112 ①	26B51 ①	A-102*	
T3A	Yoke(80°Horiz(12SEMB)	20Y-25361-1 ③	20Y807 ③	MDY-52	Y90*(8/43)		DY-36A ①	Y-16 ③	Y-41 & YC	
B	Vert(35MH)	18M-33770 ④	③ 10		③ 10		③ 10	③ 10	③ 10	
		2B-25484 ⑤								
		20C-26230 ⑤								

① Connect as auto transformer
② Drill new mounting hole(s).
③ Includes resistors R59, R60 and capacitor C75, rear cover, yoke shield, and ground lead.
④ Yoke rear cover and centering device.
⑤ Yoke shield.
⑥ Ground lead assembly.
⑦ Use original rear cover and centering device.
⑧ Looses and rotate core clamp to duplicate original shield mounting.
⑨ Connect horiz. network across yoke terms #3 and #1.
10 Use original yoke mounting hardware, if necessary.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
8	8	8	8	8	8	8	8
3	3	6	6	3	3	3	3
1	2	3	3	2	1	1	2
Special Notes	11						11

11 Connect approx. 4/n-100MMF @ 4KV capacitor across horiz. yoke terms #3 and #1.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	FIRESTONE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T4	6400Ω	3-4Ω	12C-23704	Z1113	A-3026	A-3678	24S80	S-17X	

SPEAKER

ITEM No.	TYPE				REPLACEMENT DATA		NOTES
	SIZE	FIELD	V C IMP		FIRESTONE PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω		18A-25934-1	4A07	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		FIRESTONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1A	1st Video IF	13A-24203				
B	4½ 33MC Trap					
L2	2nd Video IF	13A-24324			6804	1.5 Microhenries
L3	PIL Choke	18A-25885	19-1001			
L4A	3rd Video IF	13A-24327				
B	47.25MC Trap					
L5	PIL Choke	18A-25688	19-1001		6804	1.5 Microhenries
L6	Series Peaking Coil	18A-26926				7.5 Microhenries, 66MC
L7	Shunt Peaking Coil	18A-27302	19-3260	TV-185	6181	260 Microhenries
L8	Series Peaking Coil	18A-27667			6136	440 Microhenries
L8A	4.5MC Trap	201-23729				
B	1st Sound IF					
L10	Series Peaking Coil	18A-27486	19-3076		6172	80 Microhenries
L11	Shunt Peaking Coil	18A-27304	19-4409		6136	400 Microhenries
L12	4.5MC Trap	18A-25441				
L13	2nd Sound IF	201-23875				
L14	Quadrature Coil	201-23797	20-1005		1480	
L15	RF Choke	18A-21701				8 Microhenries

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES.		REPLACEMENT DATA							NOTES
	PRI.	SEC.	FIRESTONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	RCA TYPE No.	Ram PART No.	Thordarson PART No.	
L2	80Ω		201-24473			6313			22-T	Tapped @ 58Ω Horiz. Freq. Horiz. Phase
L17	35Ω		201-24473-3			6314			22-S	

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA				
	TOTAL DIRECT CURRENT	D.C. RESISTANCE	INDUCTANCE @ CURRENT 1000 ^(Cy.)	FIRESTONE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L16	.250A	43Ω	1.5HY	16B-25146-3	C2037 ①	C-2996 ①	C-2536 ①	25C44 ①	C-17X ①

① Drill one new mounting hole.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	REPLACEMENT DATA		
			FIRESTONE PART No.		
X1	Ant. Coupler	470MMF, 3-1Meg	RC6-70000		
X2	Ant. Coupler	470MMF, 3-1Meg	RC6-70000		
X3	Vertical interrupter	2000MMF, 5000MMF, 5000MMF, 25Ω, 250Ω, 2500Ω	17A-23376	Aerovox Centralab Erie	PA-110 PC-100 1625-01
X4	Sync Coupler	270MMF, 10000MMF, 25MMF, 270K, 2.2Meg	17A-24213	Aerovox Centralab Sprague	PA-533 PC-283 ST-3

RECTIFIERS

ITEM No.	RATING		REPLACEMENT DATA						
	CURRENT (Measured)		FIRESTONE PART No.	FEDERAL PART No.	GENERAL ELECTRIC PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	
M1	.290A		21J-25315 ①	124LA ①	1N5007 ②	MR350 ①	6Q45 ①	35QA ①	
M2	.250A		21J-25315 ①	124LA ①	1N5007 ②	MR350 ①	6Q45 ①	35QA ①	

① Selenium type.
② Germanium type.

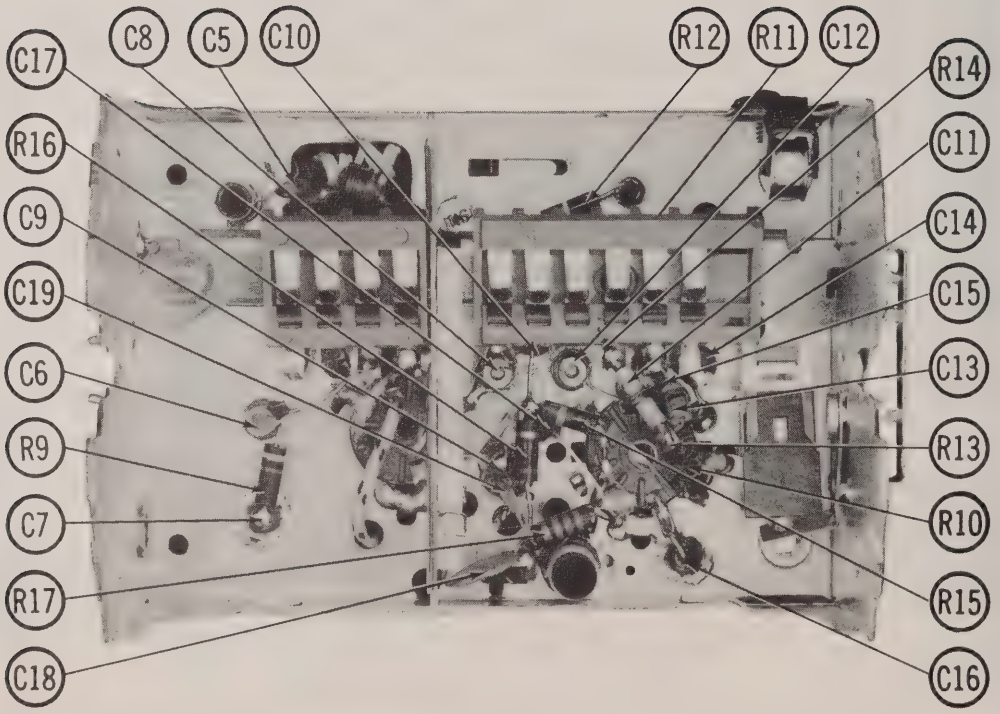
CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA		NOTES
		FIRESTONE PART No.	SYLVANIA PART No.	
M3	1N295*		1N60	Video Detector (Pigtail) * A CK-706 may be used in some versions.

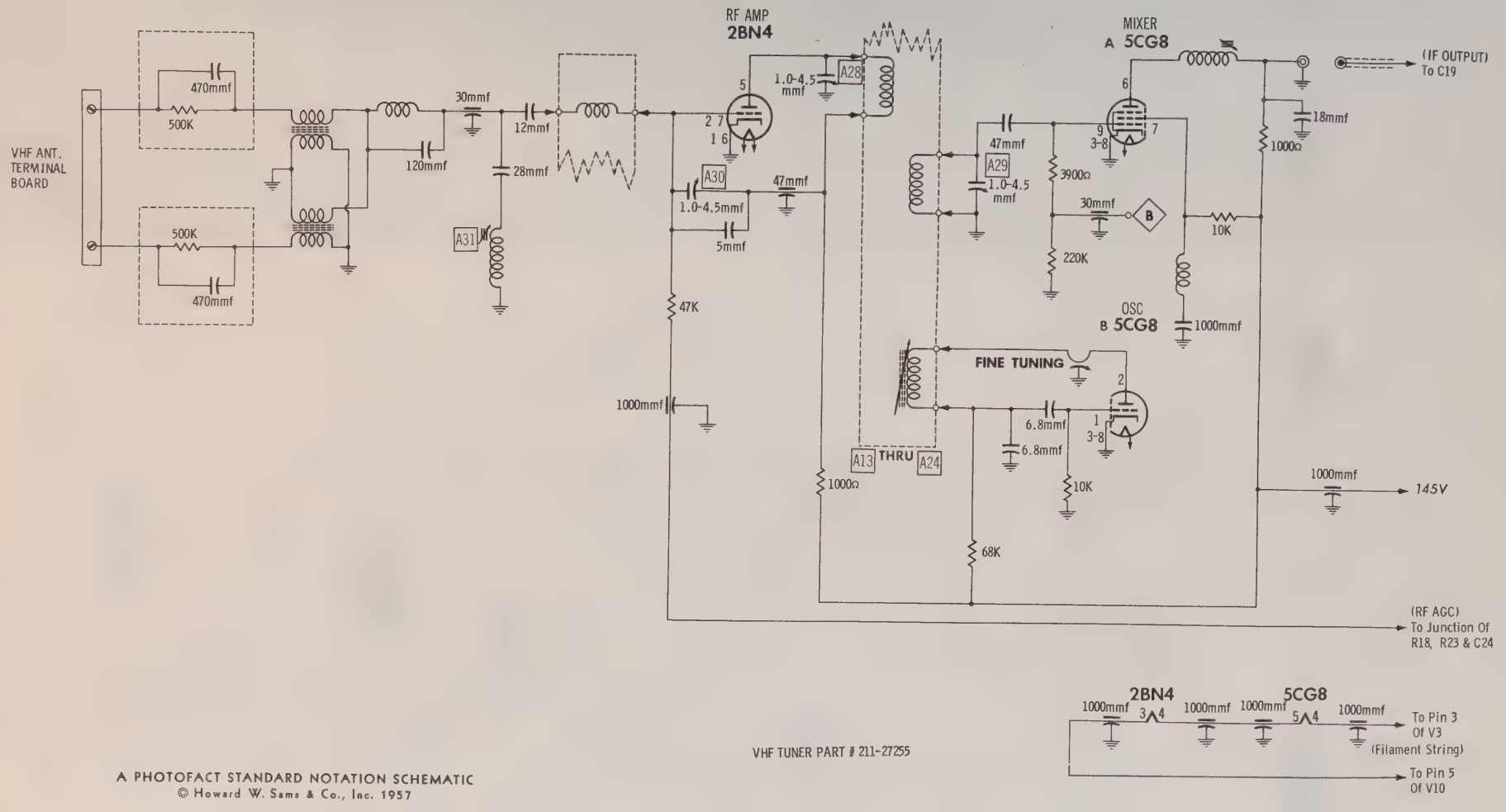
PARTS LIST AND DESCRIPTIONS (Continued)

MISCELLANEOUS

ITEM No.	PART NAME	FIRESTONE PART No.	NOTES
M4	Tuner	211-27132	VHF
	Tuner	211-27255	VHF
M5	Video Det. Ass'y.	13B-27003-1	Includes 4th Video IF, Caps., RF Choke, M3, Series Peaking Coils.
M6	Centering Device	16M-23770	
M7	Ion Trap	16M-19705	
M8	Correction Magnet		Anti-Pin Cushion (2 used)
	Yoke Clamp	49A-27154	
	Safety Glass	30M-18773	
	Handle	23A-27143	
	Handle Post	23A-27141	
	Knob	5B-27314-A221	Channel Selector
	Knob	5B-27315-A221	On-Off-Volume
	Knob	5B-27287-A221	Vertical Hold
	Knob	5B-27288-A221	Horizontal Hold
	Knob	5B-27289-A221	Brightness
	Knob	5B-27311-A29	Fine Tuning
	Knob	5B-27310-A29	Contrast
	Cabinet	200-27306	



RF TUNER BOTTOM VIEW



VHF TUNER PART # 211-27255

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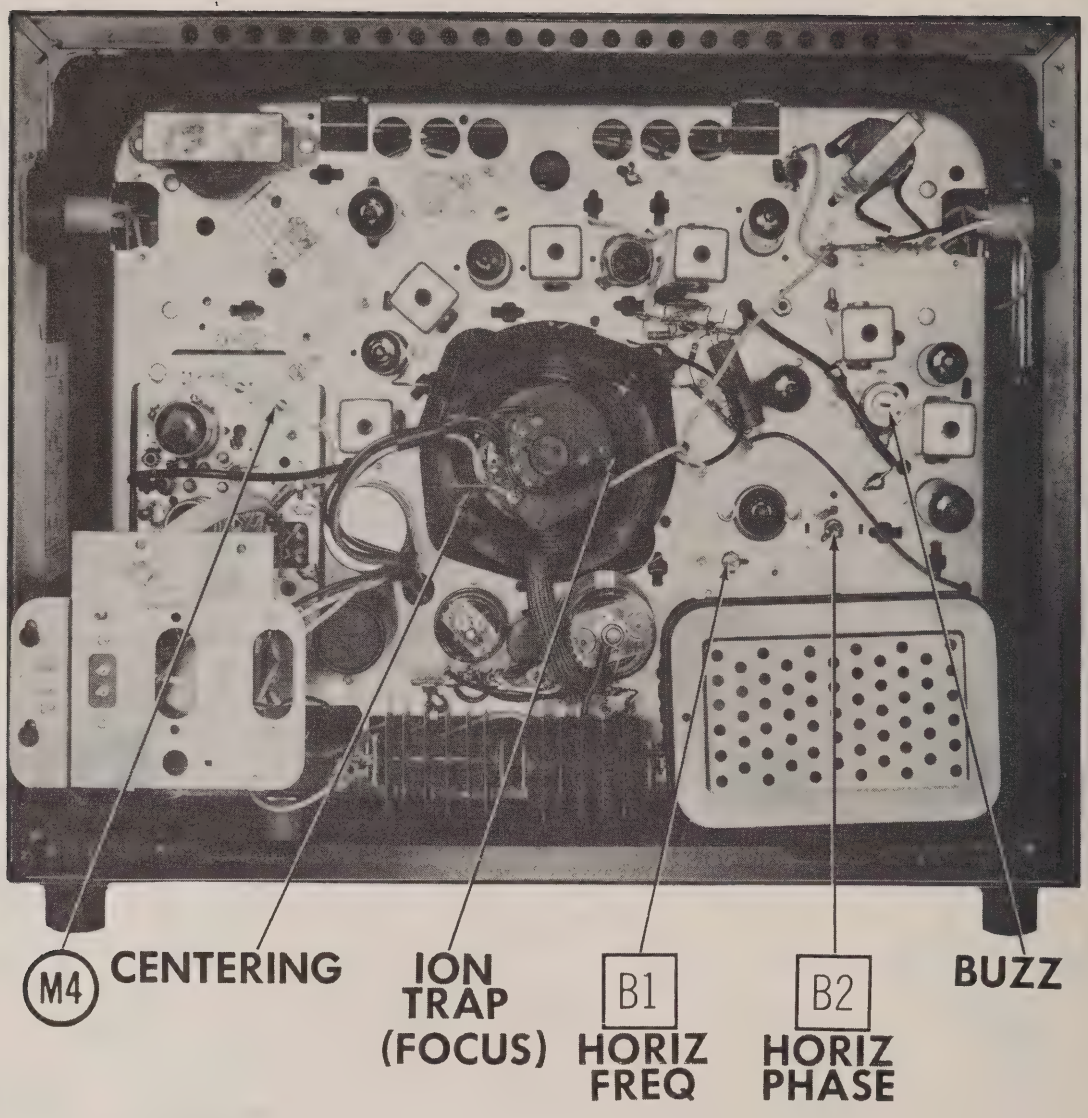
ALTERNATE TUNER SCHEMATIC



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably with a test pattern.

Turn the horizontal hold control to its mid-range position.

Connect a short clip lead across the horizontal phase coil (L17) and adjust the horizontal frequency slug (B1) until the picture synchronizes horiaontally.

Remove the clip lead, and connect the vertical amplifier of the scope to point (D). Low side to chassis.

Adjust the horizontal phase slug (B2) until equal peaks are obtained on the waveform as shown in Fig. 4.

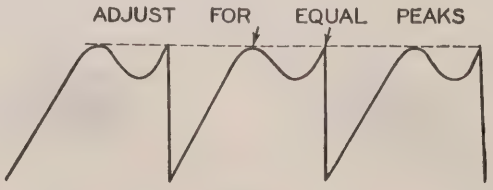


FIG. 4

PHOTOFACT* Folder

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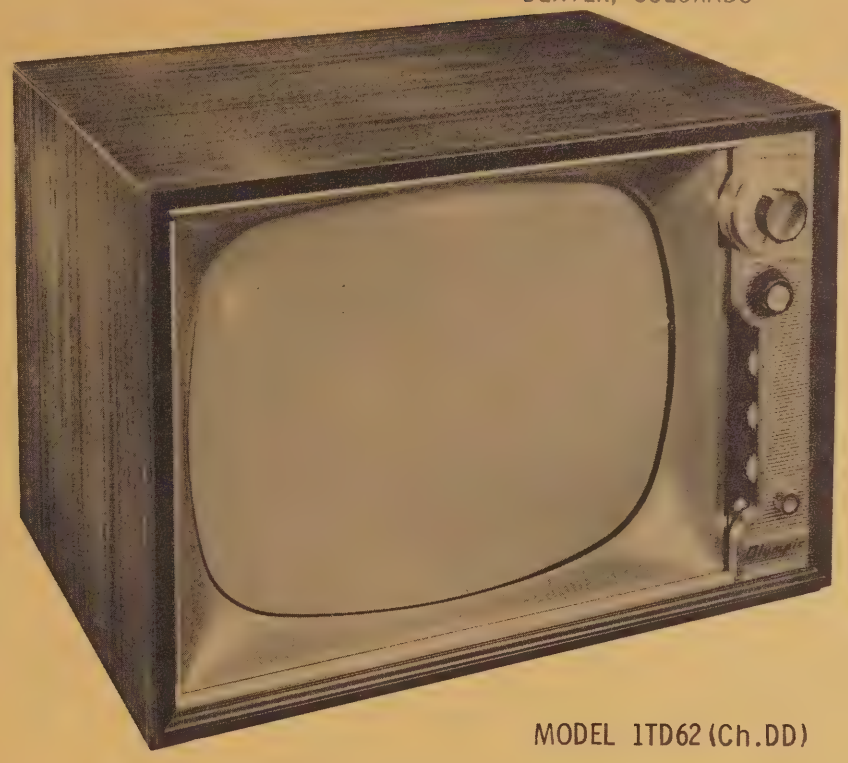

MODEL 1TD62 (Ch. DD)

OLYMPIC MODELS 1CD73, U, 1CD74, U, 1KD81, U, 1KD82, U, 1KD83, U, 1TD62, U, 4KH85, U, 4KH86, U (Ch. DD, DDU, DH, DHU)

TRADE NAME	Olympic	MODELS	CHASSIS
		1CD73, 1CD74, 1KD81, 1KD82, 1KD83, 1TD62	DD
		1CD73U, 1CD74U, 1KD81U, 1KD82U, 1KD83U, 1TD62U	DDU
		4KH85, 4KH86	DH
		4KH85U, 4KH86U	DHU
MANUFACTURER	Olympic Radio & Television Inc., 34-01 38th. Avenue, Long Island City 1, N. Y.		
TYPE SET	Television Receiver		
TUBES	Seventeen		
POWER SUPPLY	110-120 Volts AC, 60 Cycle	RATING 180 Watts, 1.5 Amp. @ 117 Volts AC	
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

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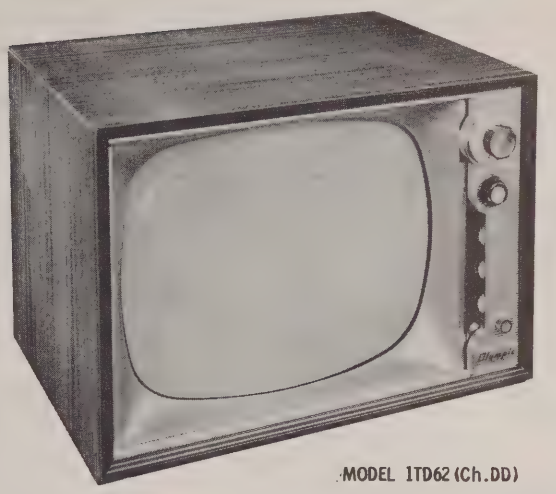
OLYMPIC MODELS 1CD73, U, 1CD74, U, 1KD81, U, 1KD82, U, 1KD83, U, 1TD62, U, 4KH85, U, 4KH86, U (Ch. DD, DDU, DH, DHU)



MODEL 1TD62 (Ch. DD)

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 5 push-on type control knobs from the front.
2. Remove the wood screw(s) and escutcheon.
3. Remove 3 push-on type control knobs from the front.
4. Remove 2 wood screws and the rear cover.
5. Remove the picture tube socket, yoke plug, speaker plug and HV lead.
6. Remove 1 chassis bolt from the top rear of the chassis.
7. Remove 2 chassis bolts from the bottom.
8. Remove the chassis.
9. Remove 2 speaker nuts and the speaker.

MODELS	CHASSIS
1CD73, 1CD74, 1KD81, 1KD82, 1KD83, 1TD62	DD
1CD73U, 1CD74U, 1KD81U, 1KD82U, 1KD83U, 1TD62U	DDU
4KH85, 4KH86	DH
4KH85U, 4KH86U	DHU

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustment of the VHF oscillator is possible by removing the channel selector and fine tuning knobs. Set the fine tuning at the center of its range. One slug for HIGH band adjustments is located at 11 o'clock, and should be adjusted first. The LOW band adjustment is located at 4 o'clock. Adjust for best picture and sound.

PICTURE TUBE SAFETY GLASS CLEANING

Remove the wood screws holding the metal trim across the top edge of the safety glass. Remove the safety glass.

SPECIAL ADJUSTMENTS

A. Focus
The focus may be varied by adjusting a screw in the focus magnet assembly. Use a nonferrous screwdriver in making this adjustment.

B. Height And Vertical Linearity
These adjustments are accessible by removing the channel selector and fine tuning knobs.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

For adjustment of the horizontal oscillator, it is necessary to remove the rear cover and supply power to set. Set the horizontal hold at the center of its range and adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally. (For location see tube placement chart).

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate audio detector buzz, adjust the buzz control for MINIMUM buzz and maximum sound. (For location see tube placement chart).

FUSES

One fuse is used for horizontal sweep circuit protection. (For location see tube placement chart).

CENTERING

Centering is accomplished mechanically by means of a centering arm. Adjust the arm from side to side, and up and down until the picture is properly centered.

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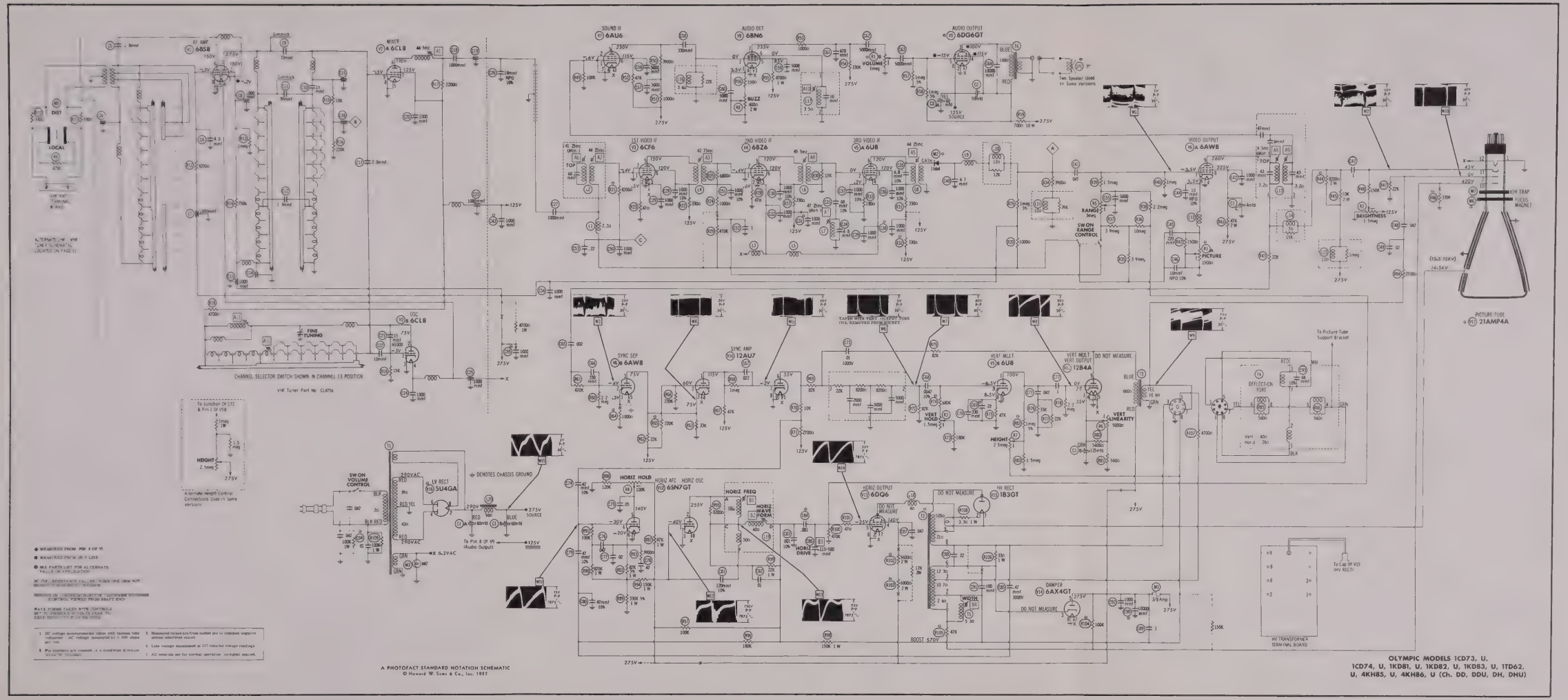

◆ MEASURED FROM PIN 3 OF V1

■ MEASURED FROM J5 V LINE

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC VOLTAGE RESISTANCE VALUES UNDER ONE OHM NOT GUARANTEED ACCURATE

RESISTOR VALUES LISTED ARE THE NOMINAL RESISTANCE VALUE OF THE RESISTOR CONTROL TURNED FROM ADJUSTMENT END

WAVE FORMS TAKEN WITH CONTROLS SET TO PRODUCE NORMAL PEAK TO PEAK DEFLECTION OF PICTURE TUBE

1. DC voltage measurements taken with vacuum tube voltmeter. AC voltages measured at 1,000 ohms per volt.
2. Tube numbers are counted as follows: beginning at the top left with the first tube and then clockwise.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation unless otherwise required.

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OLYMPIC MODELS 1CD73, U, 1CD74, U, 1KD81, U, 1KD82, U, 1KD83, U, 1TD62, U, 4KH85, U, 4KH86, U (Ch. DD, DDU, DH, DHU)

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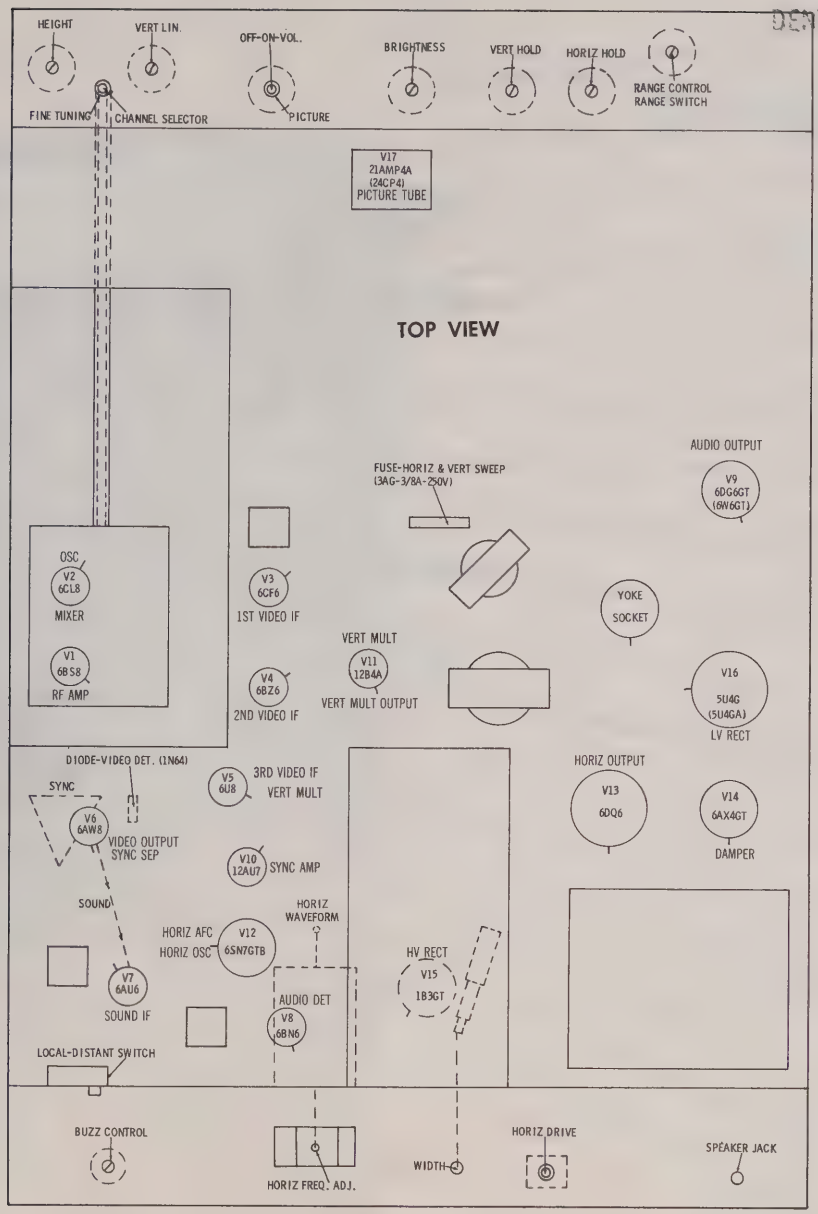
TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

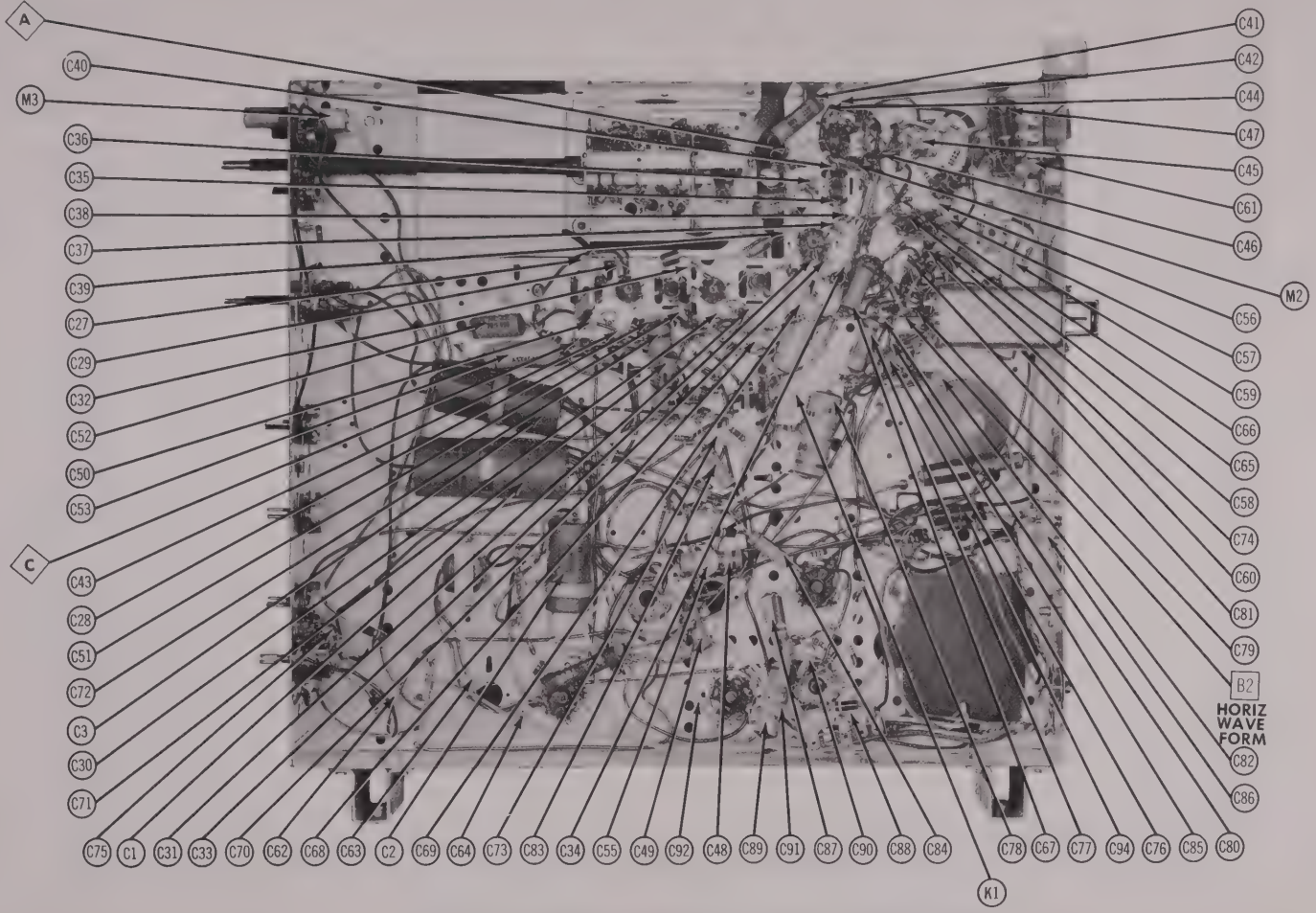
The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - V16

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V3, V4, V5, Diode (M2), V6, V9
No pic, no sound, has snow - V1, V2, V3, V9
No pic, has sound, has raster - V6, V17
Has pic, no sound - V7, V8, V9

SYNC FAILURE
No vert. sync - V6, V10, V9
No horiz. sync - V6, V10, V12, V9
No vert. or horiz. sync - V6, V10, V9

SWEEP FAILURE
No raster, has sound - Fuse (M1), V12, V13, V14, V15, V17
No vertical deflection - V5, V11
Poor vert. linearity or foldover - V5, V11
Poor horiz. linearity or foldover - V12, V13, V14
Narrow picture - V12, V13, V14, V16
Vert. off freq. - V5, V11
Horiz. off freq. - V12



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The High Voltage lead should be securely taped and kept away from the chassis.
Remove the horizontal oscillator tube (V12) and horizontal output tube (V13) from its socket to disable the high voltage.

VIDEO IF ALIGNMENT

Use lowest negative scale on VTVM.
Preset A2 and A6 out of the coils by turning A2 fully clockwise and A6 fully counter clockwise.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	10MMF	High side to point Ⓑ. Low side to chassis.	44.5MC	Any non-interfering channel	DC probe thru 100K to point Ⓐ. Common to chassis.	A1	Use only enough generator output to provide usable indication on VTVM. Adjust for maximum deflection.
2.	"	"	44.25MC	"	"	A2	"
3.	"	"	42.75MC	"	"	A3	"
4.	"	"	45.5MC	"	"	A4	"
5.	"	"	44.25MC	"	"	A5	"
6.	"	"	41.25MC	"	"	A6	Adjust for MINIMUM deflection.
7.	"	"	47.25MC	"	"	A7	"

OVERALL VIDEO IF RESPONSE CHECK

Connect the negative lead of a 4 volt bias supply to point Ⓒ. Positive to chassis.
Set range control (R5) to "off" position.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	10MMF	High side to point Ⓑ. Low side to chassis.	44.25MC (10MC Swp)	41.25MC 42.5MC 45.75MC	Any non-interfering channel	Vert. Amp. thru detector probe (Fig.1) to pin 5 (plate) of 6CF6 (V3). Low side to chassis.		Check for response curve similar to Fig. 2 with markers positioned as shown. If necessary, retouch A1, A2 and A6 to obtain desired response.
9.	"	"	"	41.25MC 42.5MC 45.75MC 47.25MC	"	Vert. Amp. thru 100K to point Ⓐ. Low side to chassis.		Check for response curve similar to Fig. 3 with markers as shown. If necessary, retouch A3, A4, A5 and A7 to obtain desired response. DO NOT retouch A1, A2, or A6.

4.5MC TRAP ALIGNMENT

Set the contrast control fully clockwise.
Remove 6U8 (V5) from its socket.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
10.	.01MFD	High side to point Ⓐ. Low side to chassis.	4.5MC (Unmod)	Any non-interfering channel	DC probe thru detector (Fig. 4) to pin 11 (cathode) of picture tube. Common to chassis.	A8	Use maximum signal generator output. Adjust A8 for MINIMUM deflection. Replace V5 in its socket.

SOUND IF ALIGNMENT

Connect the DC probe of the VTVM thru 1Meg to pin 1 (grid) of 6AU6 (V7). Common to chassis. Use the negative 30 volt scale on VTVM. Adjust A9 for maximum deflection.
Connect an output meter across the audio output transformer secondary. Set the buzz control at the center of its range and adjust A10 for maximum deflection. Adjust the buzz control for MINIMUM buzz in the sound. Retouch A10 for maximum volume.

VHF OSCILLATOR ALIGNMENT

Bottom cover and tube shields must be in place before making adjustments.
Set the fine tuning control to the center of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
11.	Two 120Ω Carbon Resistors	Across VHF antenna terminals with 120Ω in each lead.	Not used	237.5MC (Unmod)	13	Vert. Amp. thru 10K to point Ⓑ. Low side to chassis.	All	Adjust for zero beat on scope.
12.	"	"	"	103.5MC	6	"	A12	"

VHF RF AND MIXER ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

UHF ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

UHF DIAL ALIGNMENT FOR TUNER #CL4747

Turn VHF channel selector to the UHF position. Turn UHF tuning knob clockwise as far as it will go. Turn the UHF dial (without turning shaft) until the reference line on the UHF dial is directly under the cursor line on the window of the VHF channel selector knob. The dial should now be in alignment.

UHF DIAL ALIGNMENT FOR TUNER #CL5220-1

Turn VHF channel selector to UHF position. Turn fine tuning knob clockwise until the UHF dial stops turning. Rotate the UHF dial (without turning the shaft) until the number 14 is just to the right of the indicating marker on the cabinet. Thrn turn the fine tuning knob counter clockwise until the UHF dial stops rotating. The UHF dial should now be aligned so that the number 80 is just to the left of the marker. If not, readjust the dial SLIGHTLY.

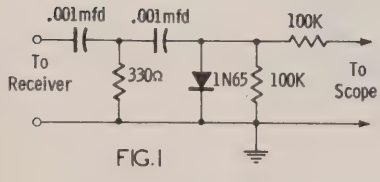


FIG.1

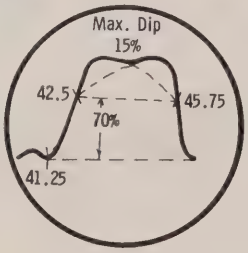


FIG.2

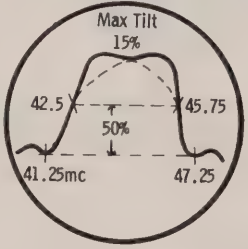


FIG.3

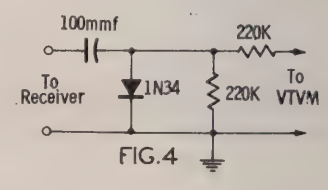


FIG.4

CHASSIS TOP VIEW

OLYMPIC MODELS 1CD73, U, 1CD74, U, 1KD81, U, 1KD82, U, 1KD83, U, 1TD62, U, 4KH85, U, 4KH86, U (Ch. DD, DDU, DH, DHU)

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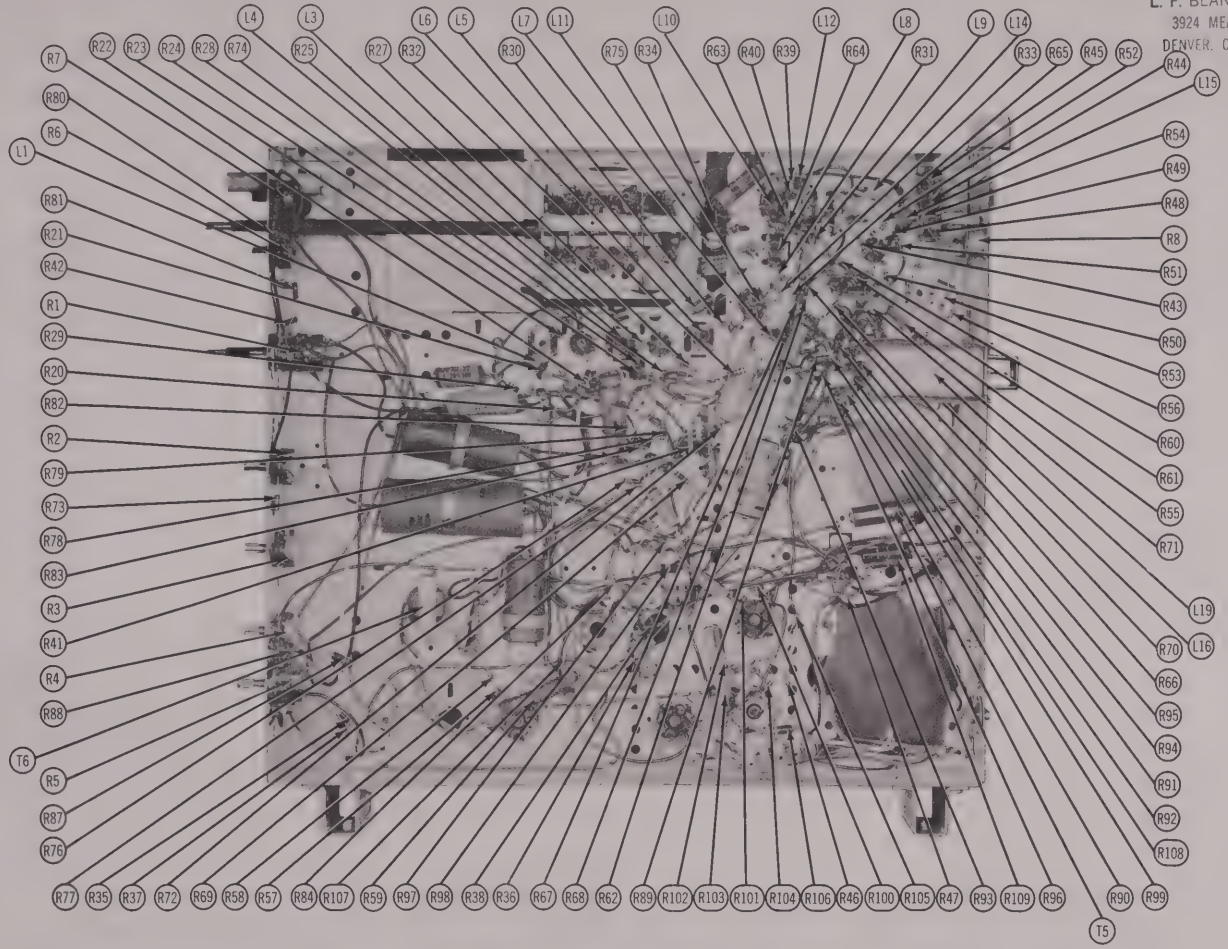
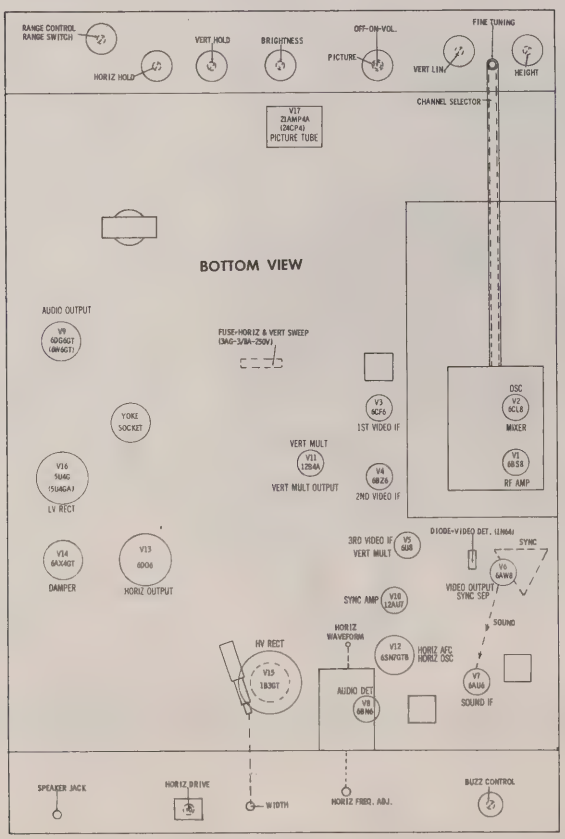


CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BS8	†56Ω	400K	INF	.1Ω	0Ω	INF	440K	0Ω	0Ω
V2	6CL8	15K	▪4700Ω	0Ω	.1Ω	0Ω	▪ 2200Ω	▪ 0Ω	0Ω	230K
V3	6CF6	1Meg	47Ω	.1Ω	0Ω	▪ 330Ω	▪330Ω	0Ω		
V4	6BZ6	280K	47Ω	.1Ω	0Ω	▪ 330Ω	▪ 330Ω	0Ω		
V5	6U8	•†1.5Meg	.1Ω	▪330Ω	.1Ω	0Ω	▪ 330Ω	180Ω	47K	•1.2Meg
V6	6AW8	1000Ω	2.2Meg	▪18K	0Ω	.1Ω	• 750Ω	700K	†47K	†4500Ω
V7	6AU6	100K	0Ω	.1Ω	0Ω	†4900Ω	†47K	0Ω		
V8	6BN6	•350Ω	3.4Ω	.1Ω	0Ω	▪ 4700Ω	3.5Ω	†330K		
V9	6DG6GT	0Ω	0Ω	†920Ω	†750Ω	500K	NC	.1Ω	¶	500K
V10	12AU7	▪ 47K	110K	▪ 22K	.1Ω	.1Ω	▪12K	▪1Meg	0Ω	0Ω
V11	12B4A	• 1600Ω	2.2Meg	0Ω	.1Ω	.1Ω	TP	2.2Meg	0Ω	†700Ω
V12	6SN7GT	480Ω	‡100K	0Ω	1.4Meg	•†60K	400K	0Ω	.1Ω	
V13	6DQ6	TP	0Ω	NC	†12K	470K	TP	.1Ω	0Ω	TOP CAP ‡42Ω
V14	6AX4GT	NC	NC	¶	NC	†56Ω	NC	.1Ω	0Ω	
V15	1B3GT			PINS	1 THRU 8	HAVE	INFINITE	RESISTANCE		TOP CAP ‡560Ω
V16	5U4GA	NC	70K	TP	39Ω	TP	43Ω	NC	70K	
V17	21AMP4A	0Ω	22K	PIN 10 ‡47K	PIN 11 • 400K	PIN 12 .1Ω				

TP TIE POINT
NC NO CONNECTION
• THIS READING WILL VARY, CONTROL SET FOR NORMAL OPERATION.
† MEASURED FROM PIN 2 OF V16.
‡ MEASURED FROM PIN 3 OF V14.
¶ THIS READING CAN VARY GREATLY, (10K MINIMUM), DUE TO THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.
▪ MEASURED FROM 125V LINE.



TUBE PLACEMENT CHART

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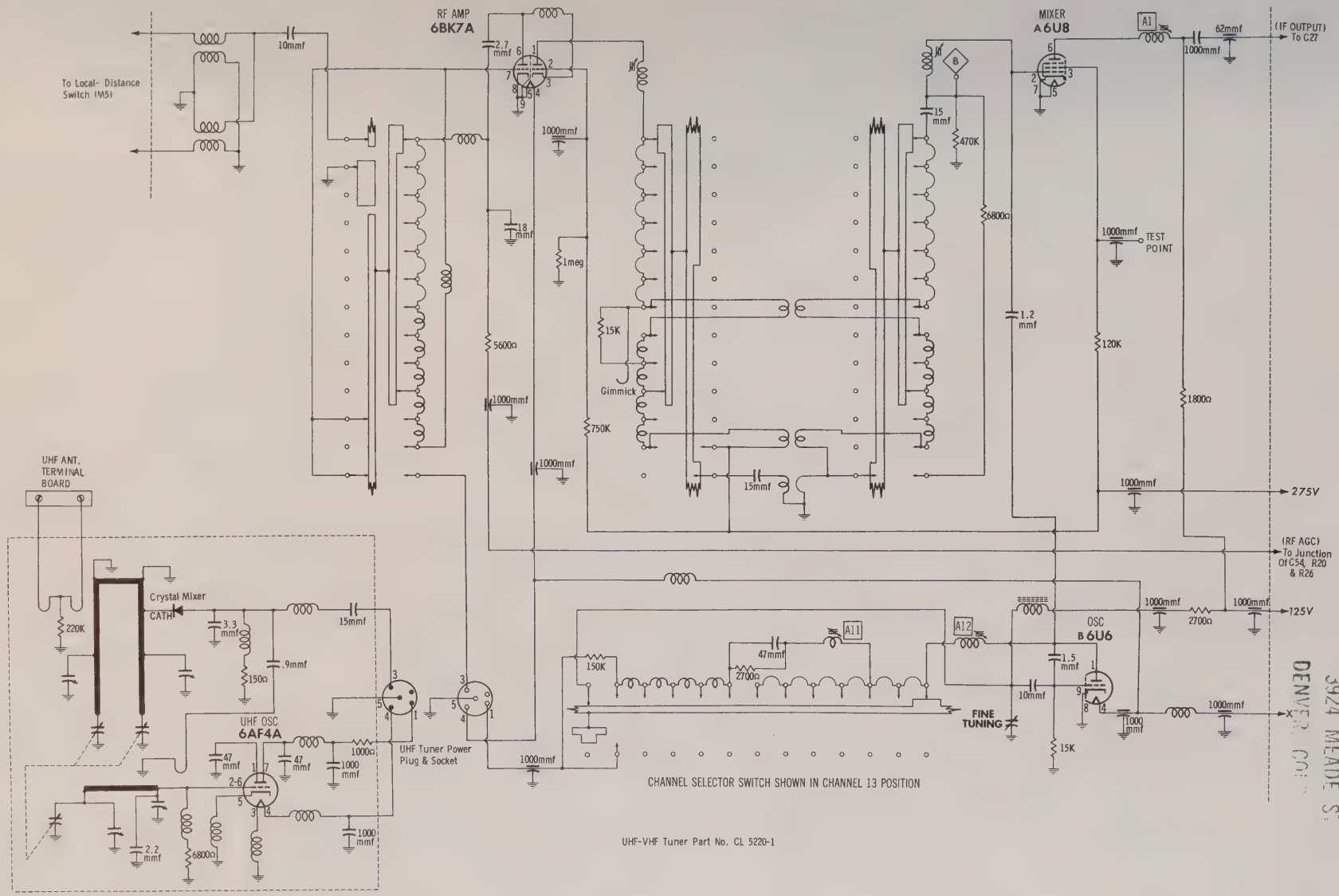

CHANNEL SELECTOR SWITCH SHOWN IN CHANNEL 13 POSITION

UHF-VHF Tuner Part No. CL 5220-1

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ALTERNATE TUNER SCHEMATIC

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TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V1	RF Amplifier	6BH8	
V2	Mixer-Oscillator	6CL8	
V3	1st Video IF Amplifier	6CF8	
V4	2nd Video IF Amplifier	6BZ6	
V5	3rd Video IF Amp -		
V14	Vert. Mult.	6U8	
V6	Video Output-Sync Sep	6AW8	
V7	Sound IF	6AU6	
V8	Audio Detector	6BH6	
V9	Audio Output	6DG6GT	Note 1
V10	Sync Amplifier	12AU7	
V11	Vert. Mult. - Vert. Output	12BA6	
V13	Horiz. AFC-Horiz. Osc.	6BN7GT	
V12	Horiz. Output	6DQ6	
V16	Damper	6A3AGT	
V15	HV Rectifier	1B3GT	
V16	LV Rectifier	5U4GA	Note 2

Note 1. Some versions may use a 5U8GT in this application.
Note 2. Some versions may use a 5U4G in this application.

PICTURE TUBE

ITEM No	REPLACEMENT DATA				NOTES
	OLYMPIC PART No	CBS PART No	GENERAL ELECTRIC PART No	SYLVANIA PART No	
V17	21AMP4A 24CP4	21AMP4A ② 24CP4A ②	21AMP4A ② 21ACP4A ② 21ACP4, 21AMP4 24CP4 24TP4, 24CP4A ②	21AMP4A ② ② Silver screen "86" 21ACP4A ② ② Aluminized 21ACP4 24CP4 24CP4A ②	
				24ADP4 ①	

ELECTROLYTIC CAPACITORS

ITEM No	RATING		REPLACEMENT DATA						
	CAP	VOLT	OLYMPIC PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C3A	60	350	CO3380	PR3-025	BO340 BR435	WT620	TMD-44 TD-4-450	D-190 FM-4504	TVA-4712.3
B	60	350							
C	4	350							
C2	50	250	CO3068-1	PR250V50	BH3025	TC59	TD-50-450	S-165	TVA-1713
C3A	60	200	CO3856	PR2-200	BO378	WD340	TMQ-117	S-190 MT-05100	TVA-3574.8
B	125	50							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No	RATING		REPLACEMENT DATA							NOTES
	CAP	VOLT	OLYMPIC PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C4	4.0					C10V4C				
C5	L.S			NP0-S1 1.5		C10V15C	TCO-1.5	2T-5S15	5TCCB-V15	
C6										
C7	1000			KT-001	MFT-1000				503C-DI	
C8	1000			KT-001	MFT-1000				503C-DI	
C9	.33				TCZ-03S					
C10	15			NP0-S1 15	TCZ-15	C10Q15C	TCO-15		5TCC-Q5	
C11	.39				TCZ-03S					
C12	1.5			NP0-S1 1.0	TCZ-1R5	C10V15C	TCO-1.5	2T-5S15	5TCCB-V15	
C13	1000			KT-001	MFT-1000				503C-DI	
C14										
C15										
C16										
C17	2.0			NP0-S1 2.2	TCZ-2R2	C10V2C	TCO-2.2	2T-5S22	5TCCB-V2C	
C18	1000			BPD-001	DD-103	BYAE01	ED-1000	DC5I1	5HK-DI	
C19										
C20	1000			BPD-001	DD-103	BYAE01	ED-1000	DC5I1	5HK-DI	
C21	15									N1000
C22	10			NP0-S1 10	TCZ-10	C10Q1C	TCO-10	2T-541	5TCC-QI	
C23	1000			KT-001	MFT-1000				503C-DI	
C24	1000			BPD-001	DD-103	BYAE01	ED-1000	DC5I1	5HK-DI	
C25	1000			KF-001	MFT-1000				503C-DI	
C26	18		CO-4S18		TCZ-18	C10Q18C	TCO-18			NP0 10%
C27	1000		CCD03X	BPD-001	DD-103	BYAE01	ED-1000	DC5I1	5HK-DI	
C28	1000		CO-4S73	1464-001		SW5T3	ED-1000	MS-II	10TL-105	
C29	1000		CCD03X	BPD-001	DD-103	BYAE01	ED-1000	DC5I1	5HK-DI	
C30	1000		CO-4S37	1464-001		SW5T1	ED-1000	MS-II	10TL-105	
C31	1000		CCD03X	BPD-001	DD-103	BYAE01	ED-1000	DC5I1	5HK-DI	①
C32	1000		CCD02X	BPD-001	DD-103	BYAE01	ED-1000	DC5I1	5HK-DI	
C33	68		CO-4S05		TCZ-68S					10%
C34	6.8			NP0-S1 6.8	C10V8SC	TCO-6.8	2T-5S68	5TCCB-V6H ②		
C35	6.8		CO-44T	NP0-S1 6.8	TCZ-6R8	C10V8SC	TCO-6.8	2T-5S68	5TCCB-V6H ②	10%
C36	1000		CO-4S37	1464-001		SW5T1	ED-1000	MS-II	10TL-105	
C37	1000		CO-4S37	1464-001		SW5T1	ED-1000	MS-II	10TL	
C38	1000		CCD02X	BPD-001	DD-103	BYAE01	ED-1000	DC5I1	5HK-DI	①
C39	1000		CCD02X	BPD-001	DD-103	BYAE01	ED-1000	DC5I1	5HK-DI	
C40	6.7		CO-4S77	BPD-01 4.7	TCZ-4R7	C10V4TC	TCO-4.7	2T-5S47	5TCCB-V4T	
C41	.047	400	CO-S-4473	BPD-05	CD-503	CUB4E47		GEM-4147	47M-S47	
C42	1000		CCD03X	BPD-001	DD-103	BYAE01	ED-1000	DC5I1	5HK-DI	
C43	1000		CCD03X	BPD-001	DD-103	BYAE01	ED-1000	DC5I1	5HK-DI	①
C44	10		CO-4S06	NP0-S1 10	TCZ-10	C10Q1C	TCO-10	2T-541	5TCC-QI	NP0 10%
C45	330		CCD03M	BPD-00033	DD-331	LU3T33	ED-330	UC-5333	5GA-T33	
C46	10		CCD03X	NP0-S1 10	TCZ-10	C10Q1C	ED-10	2T-541	5TCC-QI	NP0 10%
C47	.1	400	CO-R-4104	P4S8N-1	DF-104	CUB4P1		GEM-4101	47M-P1	
C48	.047	400	CO-S-4473	BPD-05	CD-503	CUB4E47		GEM-4147	47M-S47	
C49	.03	600	CO-S-4303	BPD-03	DF-303	CUB4E3	ED-03	GEM-4I3	47M-S2	
C50	1000	600	CO-4S02	BPD-001	DD-102	BYAE02	ED-1000	DC5I2	5HK-DI	
C51	1000		CO-4S37	1464-001		SW5T1	ED-1000	MS-II	10TL	
C52	.1	400	CO-R-4104	P4S8N-1	DF-104	CUB4P1		GEM-401	47M-P1	
C53	.22	300	CO-R-2234	P3S8N-22		CUB3P22		GEM-3032	37M-P23	
C54	1000		CCD03X	BPD-001	DD-103	BYAE01	ED-1000	DC5I1	5HK-DI	
C55	5000		CCD05X	BPD-005	DD-503	BYAE05	ED-005	DC5I5	5HK-D5	
C56	5000		CCD05X	BPD-005	DD-503	BYAE05	ED-005	DC5I5	5HK-D5	
C57	1000		CCD02X	BPD-001	DD-103	BYAE01	ED-1000	DC5I1	5HK-DI	
C58	5000		CCD05X	BPD-005	DD-503	BYAE05	ED-005	DC5I5	5HK-D5	
C59	330		CCD03M	BPD-00033	DD-331	LU3T33	ED-330	UC-5333	5GA-T33	
C60	330		CCD03M	BPD-00033	DD-331	LU3T33	ED-330	UC-5333	5GA-T33	
C61	5000		CCD05X	BPD-005	DD-503	BYAE05	ED-005	DC5I5	5HK-D5	
C62	470		CCD47M	BPD-00047	DD-471	BYAE07	ED-470	UC-5347	5GA-T47	
C63	5000		CCD05X	BPD-005	DD-503	BYAE05	ED-005	DC5I5	5HK-D5	
C64	5000		CCD05X	BPD-005	DD-503	BYAE05	ED-005	DC5I5	5HK-D5	
C65	1000		CCD02X	BPD-001	DD-103	BYAE01	ED-01	DC5I1	5HK-DI	
C66	.002	600	CO-S-4202	BPD-002	D6-202	CUB6D2	GP-3000	GEM-622	67M-D2	
C67	330		CCD03M	BPD-00033	DD-331	LU3T33	ED-330	UC-5333	5GA-T33	
C68	.022	400	CO-R-4203	BPD-03	DF-303	CUB4E3	ED-03	GEM-4I3	47M-S22	
C69	.0047	600	CO-O-S472K	1464-0047		IR5D47			9S-147	10%
C70	.22	300		P3S8N-22		CUB3P22		GEM-3032	37M-P22	③
C71	330		CCD03M	BPD-00033	DD-331	LU3T33	ED-330	UC-5333	5GA-T33	
C72	.047	400	CO-S-4473	BPD-05	CD-503	CUB4E47		GEM-4147	47M-S47	
C73	.1	400	CO-R-4104	P4S8N-1	DF-104	CUB4P1		GEM-401	47M-P1	

PARTS LIST AND DESCRIPTIONS

CAPACITORS (cont)

ITEM No	RATING		REPLACEMENT DATA							NOTES
	CAP	VOLT	OLYMPIC PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C73	01	1000	CO-O-3D3	P1088-01	DD-1083	CUB3D81		GEM-1011	10TM-S1	
C74	47		RCM15C470K	1464-000047		SW5Q47		MS-447	10TL	10%
C75	05	600	CO-R-4473	BPD-05	DF-503	CUB4E5		GEM-4I5	47M-S5	
C76	.047	400	CO-R-4473	BPD-05	DF-503	CUB4E47		GEM-4147	47M-S47	
C77	02	600	CO-R-4203	BPD-02	DF-203	CUB4E2	ED-03	GEM-4I3	47M-S2	
C78	.47	200	CO-S1I9	P2S8N-47		CUB3P47		GEM-3047	27M-P47	
C79	47		RCM15C470K	1464-000047		SW5Q47		MS-447	10TL	10%
C80	47		RCM15C470K	1464-000047		SW5Q47		MS-447	10TL	10%
C81	120		RCM30C12IK	1464-00012		SW5T12		MS-312	10TL	10%
C82	01	800	CO-S-4103	BPD-01	DD-103	CUB5D1	GP-10000	GEM-5I1	67M-D1	
C83	001	500	CO-O-S102K	1464-001		SW5T1	ED-1000	MS-II	10TL	10%
C84	001	600		BPD-001	DD-103	CUB5D1	GP-10000	GEM-5I1	67M-D1	②
C85	47	3000	CO-4252							
C86	310-580		CT3528							
C87	047	400	CO-R-4473	BPD-05	DF-503	CUB4E47		GEM-4147	47M-S47	
C88	.22	200	CO-R-2224	P2S8N-22		CUB3P22		GEM-2022	27M-P22	
C89	1	400	CO-R-4104	P4S8N-1	DF-104	CUB4P1		GEM-401	47M-P1	
C90	10000		CCD03X	BPD-01	DD-103	BYA5E1	ED-01	DC5I1	5HK-B1	
C91	100	3000	CO-3761	HVD-30-100	DD50-101	HVB30T1	HDR-100	DC5D1	30GA-T1	
C92	001		CCD02X	BPD-001	DD-103	BYAE01	ED-1000	DC5I1	5HK-DI	
C93	68	3000	CO-4520							
C94	01	600		BPD-01	DD-103	CUB5D1	GP-10000	GEM-5I1	67M-S1	②
C95	1000			BPD-001	DD-102	BYA5D1	ED-1000	DC5I1	5HK-D1	

1 Not used in some versions.
② Some versions may use a 33MMF, 47MMF or a 68MMF in this application. Replace with original value.
③ Some versions use a 1500MMF in this application.
④ Some versions use a 47MFD @ 300V (Part #CO-S179) in this application.
⑤ Some versions use a 4700MMF Mica (Part #RCM30A5M) in this application.
⑥ Some versions use an .047MFD @ 600V oil filled (Part #CO-R-4712) in this application.

CONTROLS

ITEM No	RATING		REPLACEMENT DATA						INSTALLATION NOTES
	RESISTANCE	WATTS	OLYMPIC PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No		
R1A	1500Ω	½	PT2774-1	FI-7	RTV-196	GJ-604 ⑦	U8-U8-S	Picture - Note 1	
B	1Meg			R1-S3	Not Req.		Not Req.	Volume	
C	Switch			KB-1	Not Req.		Not Req.		
R2A	1.5Meg	½	PT2SH16-1	AB-742	A47-1.5Meg-G	QU-138	U16S	Brightness	
B	Shaft			AK-4	KBS-3	Not Req.	Not Req.		
R3A	1.5Meg	½	PT2SH16-1	AB-743	A47-1.5Meg-G	QU-138	U16S	Vert. Hold	
B	Shaft			AK-4	KBS-3	Not Req.	Not Req.		
R4A	100K	½	PT2KH7-1	B-40	A47-100K-S	QU-136	U4I	Horiz. Hold	
B	Shaft			Not Req.	KBS-3	Not Req.	Not Req.		
R5A	3Meg	½	PT2S38	B-84	A47-3Meg-S		U59	Range	
B	Shaft			Not Req.	KB-3		Not Req.		
C	Switch			Not Req.	KB-3		U3-2S		
R8A	9000Ω	½	PT2SH19-1	BX-10	A47-9000-S	BU-114	TA35I,	Vert. Lin.	
B	Shaft			Not Req.	KBS-3	TM3-X31	Not Req.		
R7A	2.5Meg	½	PT2SH08	BX-53	A47-2.5Meg-G	BU-133	TA38I,	Height	
B	Shaft			Not Req.	KBS-3	TM3-X31	Not Req.		
R8	400Ω	2	PT76I		39-500		FL-800	Buzz - wire wound	

⑦ Concentrikit Equivalent, KI-KH, Base Elements & Shafts BJ-109, P-108 (Panel)
BJ-137, BJ-138 (Rear)
78-1 (Switch)
Note 1. Used in Ch. DD, DH. Alternate part #PTK4000 used in Ch. DDU, DHU.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	OLYMPIC PART No.	IRC PART No.	
R9	470Ω		RER47M	BTS-470	
R10	330Ω		RER33M	BTS-330	
R11	330Ω		RER33M	BTS-330	
R12	8200Ω			BTS-8200	
R13	1Meg			BTS-1Meg	
R14	750K			BTS-750K	
R15	10K			BTS-10K	
R16	220K			BTS-220K	
R17	3300Ω			BTS-3300	
R18	4700Ω			BTS-4700	
R19	15K			BTS-15K	
R20	10000Ω		RER10M	BTS-10000	
R21	8200Ω		RER82K	BTS-82K	Note 1
R22	33000Ω		RER33M	BTS-330	
R23	47Ω		RER470M	BTS-47	
R24	5600Ω		RER56M	BTS-5600	
R25	5600Ω		RER56K	BTS-5600	
R26	1Meg 5%		RER10M	BTS-1Meg 5%	
R27	330Ω		RER33M	BTS-330	
R28	47Ω		RER470M	BTS-47	
R29	470K		RER474M	BTS-470K	
R30	15K		RER15K	BTS-15K	
R31	3300Ω		RER33K	BTS-330	
R32	330Ω		RER33M	BTS-330	Note 2
R33	180Ω		RER18K	BTS-180	
R34	5600Ω		RER56M	BTS-5600	
R35	3.9Meg		RER39M	BTS-3.9Meg	
R36	10Meg		RER10MEG	BTS-10Meg	
R37	3.9Meg		RER39M	BTS-3.9Meg	
R38	2.2Meg		RER22M	BTS-2.2Meg	
R39	1.5Meg		RER15K	BTS-1.5Meg	
R40	1Meg		RER10K	BTS-1Meg	
R6	47K	2	RER47M	BTS-47K	
R43	1500Ω		RER15M	BTS-1500	
R44	22K		RER22M	BTS-22K	
R44	68000Ω	2		BTS-8200	Note 3
R45	330Ω			BTS-10K	
R46	330Ω			BTS-330K	Note 2
R47	22K		RER22K	BTS-22K	
R48	180K		RER184K-A	BTS-180K	
R49	100K		RER10M4	BTS-100K	
R50	3900Ω		RER39K	BTS-3900	
R51	1000Ω		RER10M	BTS-1000	
R52	47K		RER47M	BTS-47K	
R53	1000Ω		RER10M	BTS-1000	
R54	330K		RER334K-A	BTS-330K	
R55	4700Ω	1	RER47M	BTS-4700	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	OLYMPIC PART No.	IRC PART No.	
R57	1Meg 5%		RER10K	BTS-1Meg 5%	
R58	1Meg 5%		RER10K	BTS-1Meg 5%	
R59	700Ω	10	RER69	1 3/4-700	
R60	2.2Meg		RER22M	BTS-2.2Meg	
R61	470K		RER474M	BTS-470K	
R62	22K		RER22K	BTS-22K	
R63	333K		RER333K-I	BTS-33K	
R64	1000Ω		RER10M	BTS-1000	Note 2
R65	330K		RER33K	BTS-330K	Note 4
R66	220K		RER224K	BTS-220K	
R67	47K		RER47K	BTS-47K	
R68	1Meg		RER10M4	BTS-1Meg	
R69	82K		RER82K	BTS-82K	
R70	10K		RER10K	BTS-10K	
R71	2700Ω		RER27K	BTS-2700	
R72	33K		RER33K	BTS-33K	
R73	180K		RER184K-A	BTS-180K	
R74	680K		RER684K	BTS-680K	Note 5
R75	47K		RER473K	BTS-47K	
R76	33K		RER333K-I	BTS-33K	
R77	22K		RER223K	BTS-22K	
R78	2.2Meg		RER225K	BTS-2.2Meg	
R79	82K		RER83K	BTS-82K	
R80	5600Ω		RER562K	BTS-5600	
R81	560Ω		RER56K	BTS-560	
R82	1Meg 5%	1		BTS-1Meg 5%	Note 6
R83	1.5Meg		RER15K	BTS-1.5Meg	
R84	4700Ω			BTS-4700	
R85	560Ω		RER56K		
R86	560Ω		RER56K		
R87	47K	1	RER473K-A		
R88	180K		RER184K		
R89	330K 5%	1	REC334J-A		
R90	82K	1	RER824K-A		
R91	330K		RER334K		
R92	82K 5%	1	REC823J-A		
R93	1900Ω		RER191K		
R94	150K	1	RER154J-A		
R95	8200Ω		RER822K		
R96	180K		RER184K-A		
R97	100K		RER104K-A		
R98	180K	1	REC184K		
R99	22K	1			
R100	470K		RER474M	BTS-470K	
R101	47Ω		RER470M	BTS-47	
R102	5600Ω	2	RED563K	BTS-5600	Note 7
R103	5600Ω	2	RED563K	BTS-5600	Note 7
R104	100K		RER104K-A	BTS-100K	Note 8

RESISTORS (cont)

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	OLYMPIC PART No.	IRC PART No.	
R105	47K		BTS-47K	Note 9	
R106	33Ω	1	REC330M	BTA-33	
R107	4700Ω		RER472M	BTS-4700	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	OLYMPIC PART No.	IRC PART No.	
R108	3.3Ω	1	RER4I9M	BW-3.3	
R109	100K	1	REC104M	BTA-100K	

Note 1. Some versions may use a 12K in this application.
Note 2. Not used in some versions.
Note 3. Some versions may use a 10K in this application.
Note 4 Some versions may use a 150K in this application.
Note 5 Some versions may use a 820K in this application.
Note 6 Some versions may use a 1.5Meg, 1W in this application.
Note 7. Some versions may use a single 12K, 2W in place of R102 and R103.
Note 8. Some versions may use a 47K, 1W in this application.
Note 9. Some versions may use a 100K in this applications.

TRANSFORMER (POWER)

ITEM No	RATING				REPLACEMENT DATA					
	PRI	SEC 1	SEC 2	SEC 3	OLYMPIC PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No
T1	117VAC	570VCT	5V	6.3V	TRS26H-1			P-8077	P-8332 ① ②	R-46BC
	@ 1.5A	@ 240A	@ 3A	@ 8.5A						

① Fabricate mounting
② Parallel and phase 6.3V filament windings
③ Parallel and phase 6.3V @ 8A and 6.3V @ 1.9A filament windings, tape 6.3V @ 1.5A filament winding.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No	USE	REPLACEMENT DATA						
		OLYMPIC PART No.	Halldorson PART No.	Merit PART No.	RCA TYPE No	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No
T2	Horiz. Output	TRS599-4A	FB4U & FB20 * ①	HVO-47 *① HVO-47 *②			HO-257 & WC-5 * ①	FLY-16 & WC-20 *①	
	Alt. Horiz. Output	TRS599-4	FB4U & FB20 * ②	HVO-47 *②			HO-257 & WC-5 *②	FLY-16 & WC-20 *②	
	Alt. Horiz. Output	TRS599-3	FB4U & FB20 *①	HVO-47 *①			HO-257 & WC-5 *①	FLY-16 & WC-20 *①	
T3	Vert. Output (.09MH)	TRS355	22B03	A-3026	2D4TP①	V30P	A-3122	26S51	A-41JX
T4A	Yoke-Horiz. (.09MH)	CL2600-3	DF807 ③	MDF-92 ③	2S5DA ③	V90F19/03 ③	DY-16A ③	Y-16 ③	A-41JX & NW3
B	(90°) Vert. (40.5MH)								
T5	Width Coil	CL5402	RF900 ③	MWC-5	21UR1	20UR12	WC-8	WC-22	

① Drill new mounting hole(s).
② Use original horizontal yoke damping network, if necessary.
③ Use terminals #3 and #4.
* This part may be superceded by Parts Manufacturer's introduction of special unit for this application.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

	ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Ram Replacement Type Is Listed	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
	9	9	9			14	9	
	8	8	8			11	7	
	8	8	8			4	7	
	3	See Note ② NC	See Note ② NC			6	See Note 4 NC	
	2	3	3			8	3	
	1	1	1			9	1	
Cannot Width Coil Assy	5	See Note ③						
		1 & 3	1 & 3			1 & 6	1 & 3	
Special Note ①		③ ⑤	③ ⑤			③	③	

5 Install horizontal damping network, consisting of 10000 resistor and 68MMF capacitor across horizontal yoke terminals #3 and #7.
② Use terminals #3 and #2.
③ Remove resistor R106 and capacitor C88 from circuit.
④ Jumper terminals #8 and #7.
⑤ Jumper terminals #1 and #7

TRANSFORMER (AUDIO OUTPUT)

ITEM No	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI	SEC	OLYMPIC PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Triad PART No.	
T6	2400Ω	3-4Ω	TRS76S-1	22U01	A-3035	A-3332	26S50 ①	S-12X ① Drill one new mounting hole.

SPEAKER

ITEM No	TYPE				REPLACEMENT DATA		NOTES
	SIZE	FIELD	V C IMP		OLYMPIC PART No.	GUAM PART No.	
SP1	5"	PM	3-4Ω		SK3788-2 ①	5A07	① Used in Models ITD62, U
	6"	PM	3-4Ω		SK3905-2 ②	8A2I	② Used in Models ICD73, U, ICD74, U
	5	PM	11Ω		SK2147-1 ③	5A15T	③ Used in Models IKD83, U, 4KH86, U
	8"	PM	3-4Ω		SK2148-1 ④	8A31	④ Used in Models IKD62, U
	4"	PM	3-4Ω		SK4342 ⑤	4A07	⑤ Used in Models IKD81, U
	6"	PM			SK5373 ⑥		
	8"x5"	PM			SK5376 ⑦		

OLYMPIC MODELS 1CD73, U, 1CD74, U, 1KD81, U, 1KD82, U, 1KD83, U, 1TD62, U, 4KH85, U, 4KH86, U (Ch. DD, DDU, DH, DHU)

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		OLYMPIC PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	RF Choke	CL1535	19-3036	TV-180	6176	36 Microhenries
L2	1st. Video IF	CL4806				Includes 41.25MC Trap
L3	Fil. Choke	CL2427	19-1001		4604	1.8 Microhenries
L4	2nd. Video IF	CL4511	17-4522	TV-130	6219	
L5	Fil. Choke	CL2427	19-1001		4604	1.8 Microhenries
L6	3rd. Video IF	CL4511	17-4523	TV-130	6219	
L7	47.25MC Trap		20-1049	TV-153		
L8	4th. Video IF	CL4511	17-4524	TV-130	6219	
L9	RF Choke		19-1001		4604	1.7 Microhenries
L10	Series Peaking Coil		19-3180 ♦	TV-184 ♦	6180 ♦	180 Microhenries, wound 12K resistor
L11	Shunt Peaking Coil	CL1537	19-4180	TV-183	6179	180 Microhenries, wound on 39K resistor
L12	Cathode Choke		19-1001		4604	1.7 Microhenries
L13A	4.5MC Trap	TR3386-1				
B	Sound IF					
L14	Series Peaking Coil	CL3398	19-3250 *	TV-185 *	6181 *	250 Microhenries, wound on 15K resistor
L15	Shunt Peaking Coil	CL3403	19-3300 ▲		6155 ▲	300 Microhenries, wound on 1Meg resistor
L16	RF Choke		19-3075 ■		6172 ■	80 Microhenries, wound on 22K resistor
L17	Quadrature Coil	CL3603-1			1481	Includes 10MMF Cap.
L18	RF Choke		19-1004		4610	6.8 Microhenries, IRC Part #CL-1

* Parallel with 15K resistor.
▲ Parallel with 1Meg resistor.
♦ Parallel with 12K resistor.
■ Parallel with 22K resistor.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES.		REPLACEMENT DATA							NOTES
	PRI.	SEC.	OLYMPIC PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	RCA TYPE No.	Ram PART No.	Thordarson PART No.	
L19	70Ω		TR2294	20-1402	TV-162	6183	205R1	H-100	HS-3	Tapped @ 50Ω

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					
	TOTAL DIRECT CURRENT	D.C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∿)	OLYMPIC PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L20	.240A	56Ω	.6Hy.	CK4047	C5037①	C-2996 ①	C-2326 ①	26C44 ①	C-24X ①

① Drill one new mounting hole.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	OLYMPIC PART No.	REPLACEMENT DATA	
K1	Vertical Integrator	2000MMF, 5000MMF, 5000MMF, 22K, 8200Ω, 8200Ω	PC2435	Aerovox Centralab Cornell-Dubilier Erie Sprague	PA-110 PC-100 115TM1 1405-01 V-1

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			OLYMPIC PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG	3/8A 250V	FU3958 *	FH3852	312.375 (3AG 3/8A)	357001	AGC 3/8	4406

* Alternate part #FU4345.

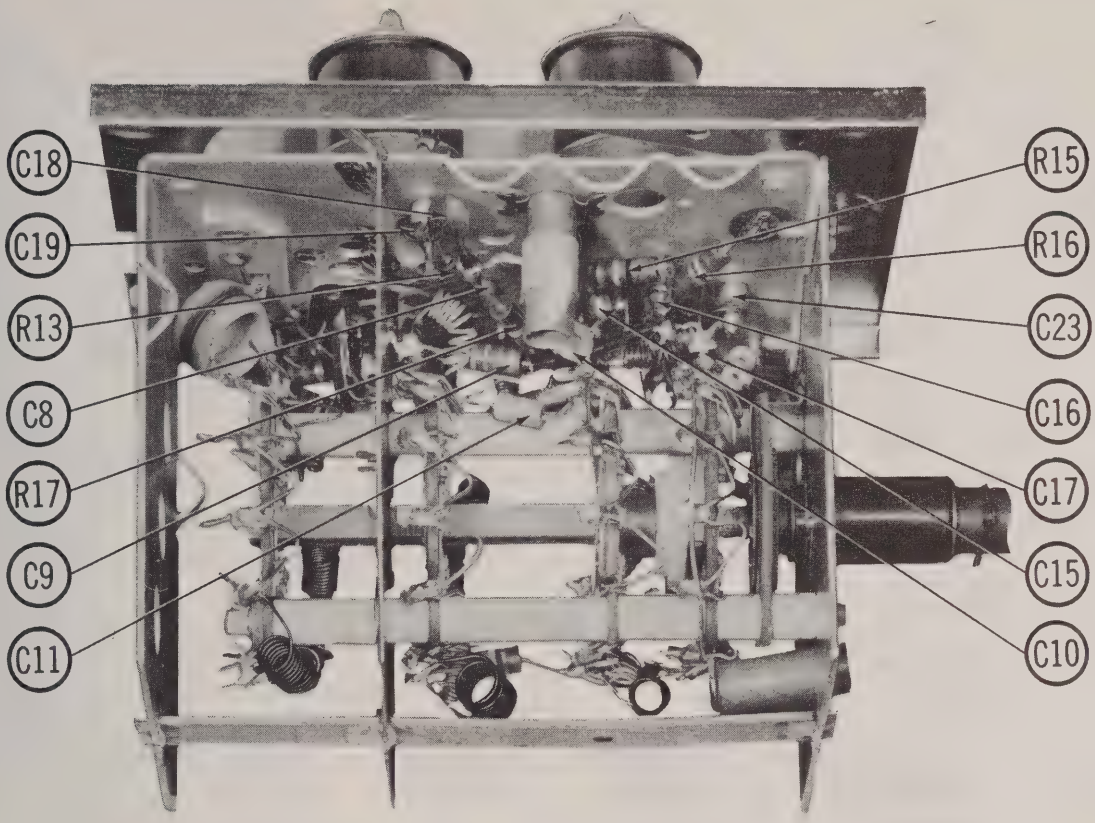
CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA		NOTES
		OLYMPIC PART No.	SYLVANIA PART No.	
M2	1N64 *		1N60	Video Detector (Pigtail)

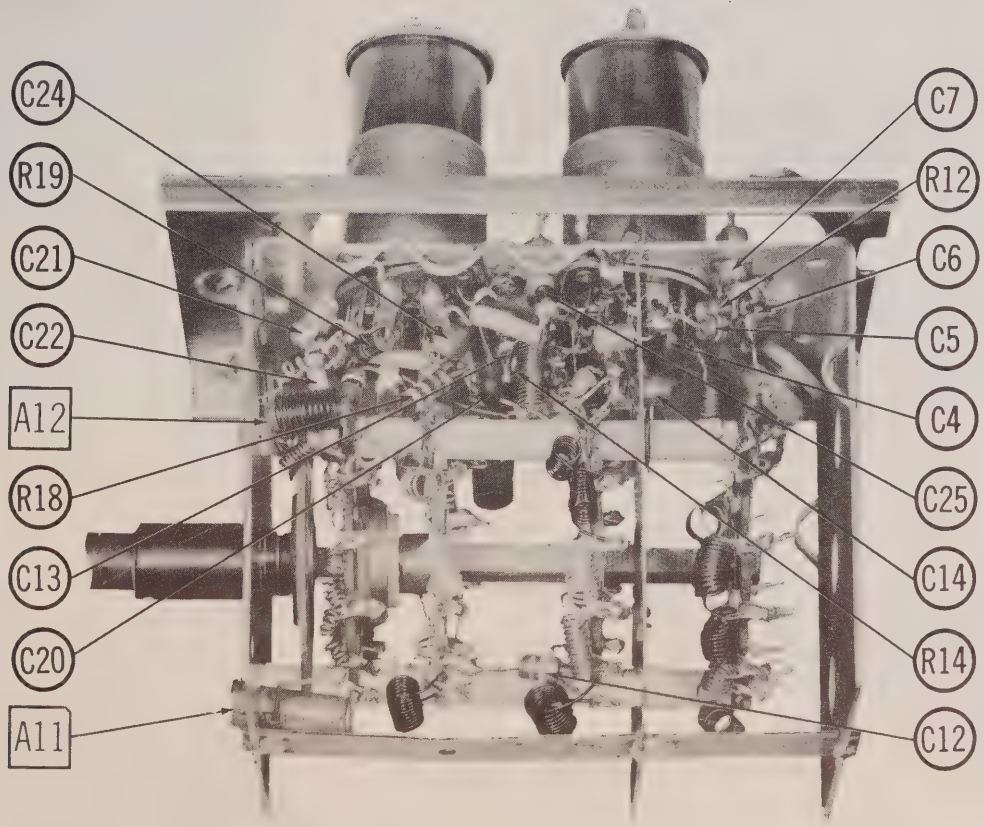
* A 1N60 may be used in some versions.

MISCELLANEOUS

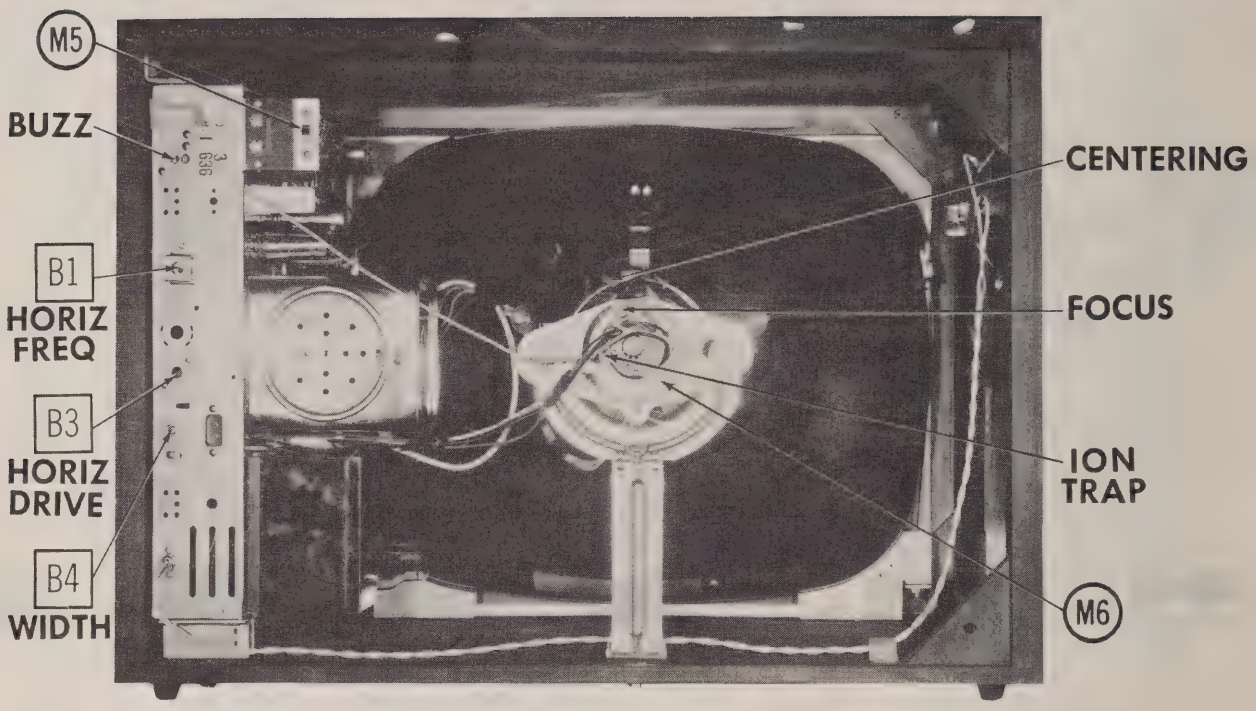
ITEM No.	PART NAME	OLYMPIC PART No.	NOTES
M3	Pilot Light	BU187	#47
M4	Tuner	CL4756	VHF, Used in Ch. DD, DH
	Tuner	CL4747	UHF/VHF - Used in Ch. DDU, DHU
	Tuner	CL5220-1	UHF/VHF - Used in Ch. DDU, DHU
M5	Switch	SW2966-1	Local-Distant, Slide Type (DPDT)
M6	Focus Magnet	PP4418	Used in Ch. DD, DH, DDU, DHU - Includes centering device
M7	Ion Trap	PP2248	
	Safety Glass	PP3656-1	Ch. DD, DDU
	Safety Glass	PP3939-1	Ch. DH, DHU
	Mask	PP3646-2	Ch. DD, DDU
	Mask	PP3938	Ch. DH, DHU
	Cabinets	CA5222	Model 1TD62, U
	Cabinets	CA5223	Model 1CD73, U
	Cabinets	CA5224	Model 1CD74, U
	Cabinets	CA5225	Model 1KD83, U
	Cabinets	CA5239	Model 1KD81, U
	Cabinets	CA5240	Model 1KD82, U
	Cabinets	CA5241	Model 4KH85, U
	Cabinets	CA5242	Model 4KH86, U



RF TUNER-LEFT SIDE



RF TUNER-RIGHT SIDE



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably with a test pattern. Connect a short jumper across terminals "C" and "D" of the horizontal oscillator transformer (L19)

Set the horizontal hold control fully clockwise. Adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally. Remove the jumper from L19. Connect the high side of the vertical amplifier of the scope to terminal "C" of L19. Low side to chassis. Adjust the horizontal waveform slug (B2) for a waveform similar to Fig. 5 with the broad and narrow peaks of equal amplitudes. If necessary, during adjustment of B2 keep the picture in sync with the horizontal hold control or B1. Remove the scope and retouch B1 for the following conditions.

1. At full clockwise position of the horizontal hold control, a blanking bar or horizontal jitter should be evident.

2. At full counter clockwise position of the horizontal hold control, the picture should lose sync with $4\frac{1}{2}$ to 5 diagonal bars slanting down to the left. If the picture remains in sync at either extreme setting of the horizontal hold control, switch off channel and back again so that the picture will fall out of sync.

Adjust the horizontal drive trimmer (B3) counter clockwise as far as possible without the presence of vertical white lines or compression near the center of the raster. If neither of these conditions appear, adjust B3 for a picture slightly wider than necessary to fill the picture mask horizontally.

Adjust width slug (B4) for picture slightly wider than necessary to fill the picture mask horizontally.

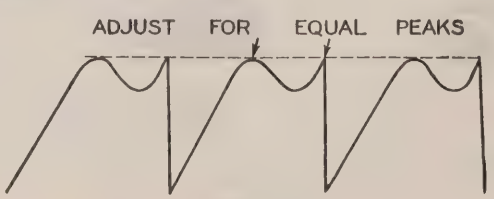


FIG. 5

PHILCO
MODEL E1360

PROPERTY
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

PHILCO
MODEL E1360

PHILCO
MODEL E1360

TRADE NAME	Philco Model E-1360
MANUFACTURER	Philco Corp., Tioga & "C" Sts., Philadelphia, Pa.
TYPE SET	AC Operated Phono Amplifier With 4 Speed Automatic Record Changer
TUBES (Three)	Types 12AU6 AF Amplifier, (2) 50C5 Output
POWER SUPPLY	105-125 Volts AC-60 Cycle RATING .32 Amp. @ 117 Volts AC (30 Watts without motor)

FOR SERVICE INFORMATION ON PHILCO RECORD CHANGER MODEL M-39 - SEE PHOTOFACT SET 362 - FOLDER 6

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

PHILCO
MODEL E-1360

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	AF Amplifier	12AU6	
V2	Output	50C5	
V3	Output	50C5	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	PHILCO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	30	150	30-2575-45	PRS150V30 3020	BBRT32V215	TCT3113	TDLT-2	FMT-1530	TVA-3444
B	25	150							
C	20	150							
C2	10	25	30-2417-8	PRS25V10	BBR10-25	TC22	TD-10-25	FM-0210	TVA-1204

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	PHILCO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C3	.01	600	30-4650-58	BPD-01	DD-103	CUB6S1	GP-10000	GEM-611	6TM-S1	
C4	220		62-122001001	SI 220	D6-221	LT6T22	GP-220	UC-5322	5HK-T22	
C5	.1	400	30-4650-47	P488N-1	DF-104	CUB4P1		GEM-401	4TM-P1	
C6	.0033	600	30-4650-55	BPD-0033	D6-332	CUB6D33	GP-3300	GEM-6233	6TM-D33	
C7	.1	400	30-4650-47	P488N-1	DF-104	CUB4P1		GEM-401	4TM-P1	
C8	.047	400	30-4650-45	BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	
C9	330			SI 330	D6-331	LT6T33	GP-330	UC-5333	5GA-T33	Note 1
C10	.047	600	30-4650-62	BPD-05	DF-503	CUB6S47		GEM-6147	6TM-S47	
C11	.1	400	30-4650-47	P488N-1	DF-104	CUB4P1		GEM-401	4TM-P1	
C12	.001	600	30-4650-52	BPD-001	D6-102	CUB6D1	GP-1000	GEM-621	6TM-D1	
C13	.0033	400	30-4650-55	BPD-0033	D6-332	CUB6D33	GP-3300	GEM-6233	6TM-D33	
C14	.022	400	30-4650-43	BPD-02	DD-203	CUB4S22	ED-02	GEM-4122	4TM-S22	
C15	.022	400	30-4650-43	BPD-02	DD-203	CUB4S22	ED-02	GEM-4122	4TM-S22	
C16	.1	400	30-4650-47	P488N-1	DF-104	CUB4P1		GEM-401	4TM-P1	

Note 1. Some versions use 270MMF in this application (Part #60-10275337).

CONTROLS

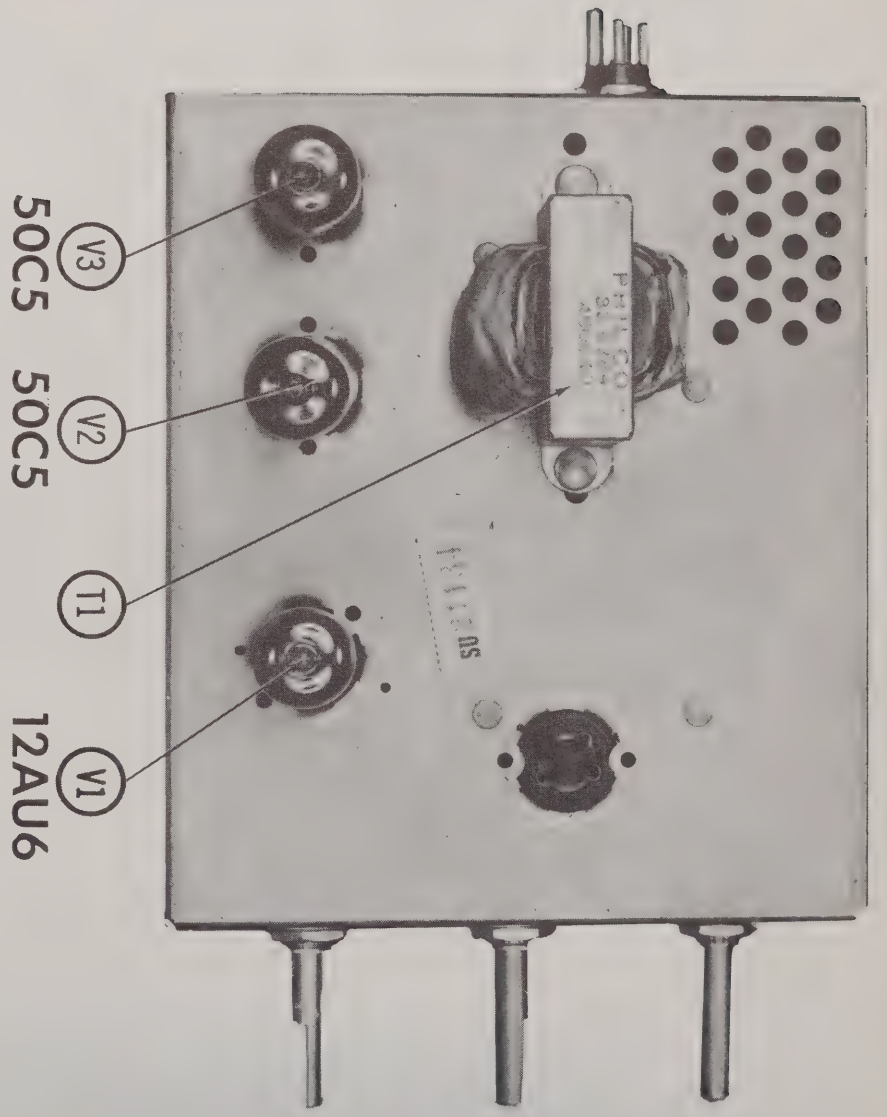
ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	PHILCO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	2Meg	½	33-5535-46	BT-82	A47F3-2Meg	Q18-139X	UT-451	Volume-Tap @ 1Meg
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R2A	1Meg	½	33-5587-21	B-70	A47-1Meg-Z	Q13-137	U53	Bass
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R3A	1Meg	½	33-5587-23	B-68		Q17-137	U52	Treble
B	Shaft			Not Req.		Not Req.	NotReq.	
			33-5587-21					Alternate treble

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	PHILCO PART No.	IRC PART No.	
R4	82K		66-3828340	BTS-82K	
R5	100Ω		66-1108340	BTS-100	
R6	4700Ω		66-2478340	BTS-4700	
R7	270K		66-4278340	BTS-270K	
R8	680K		66-4688340	BTS-680K	
R9	2700Ω		66-2278340	BTS-2700	
R10	470K		66-4478340	BTS-470K	
R11	3300Ω		66-2338340	BTS-3300	
R12	4700Ω		66-2478340	BTS-4700	
R13	150Ω	2	66-1155340	BTB-150	
R14	2.2Meg		66-5228340	BTS-2.2Meg	
R15	2.2Meg		66-5228340	BTS-2.2Meg	
R16	10K		66-3108340	BTS-10K	
R17	1000Ω		66-2108340	BTS-1000	
R18	33Ω	1	66-0334340	BTA-33	
R19	33Ω	1	66-0334340	BTA-33	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC. 1	PHILCO PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	4000Ω CT	3-4Ω	32-8789						
	Turns	Ratio							
	PRI.	SEC. 2							
	17	1							

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	PHILCO PART No.	QUAM PART No.	
SP1 SP2	6½"	PM	3-4Ω	36-1641-24 36-1656 ①	6A15	① Electrostatic type

COILS

ITEM No.	USE	REPLACEMENT DATA				NOTES
		PHILCO PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Crossover Choke	32-4628			4580	.1 Henry

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT (Measured)	PHILCO PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.	
M1	.070A	34-8041-4	1004A	RS100	6S100	100	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA					REMARKS
	PHILCO PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	MOUNT	
M2	325-8018 ①	55-T	GD-J	56	PT-2	① Includes needle

ASTATIC NEEDLE LISTING SHOWN ABOVE IS SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGE LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

PHONO NEEDLE

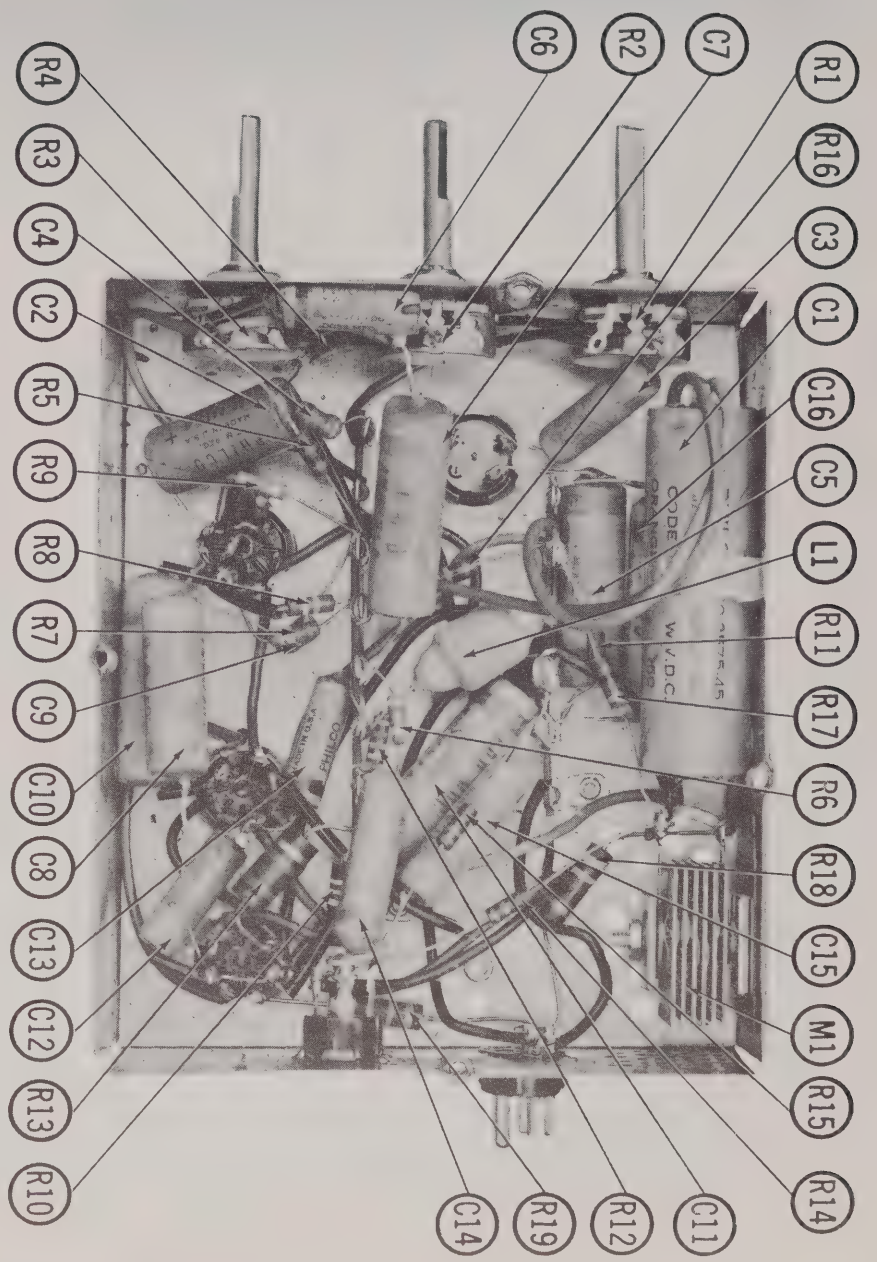
(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	PHILCO PART No.	JENSEN PART No.	WALCO PART No.	
M3	325-8019	†S-66 or †♦S-66SD or ♦S-66D	†W-75TPS or †♦W-75DS or ♦W-75TPD	† Jewel ♦ Diamond

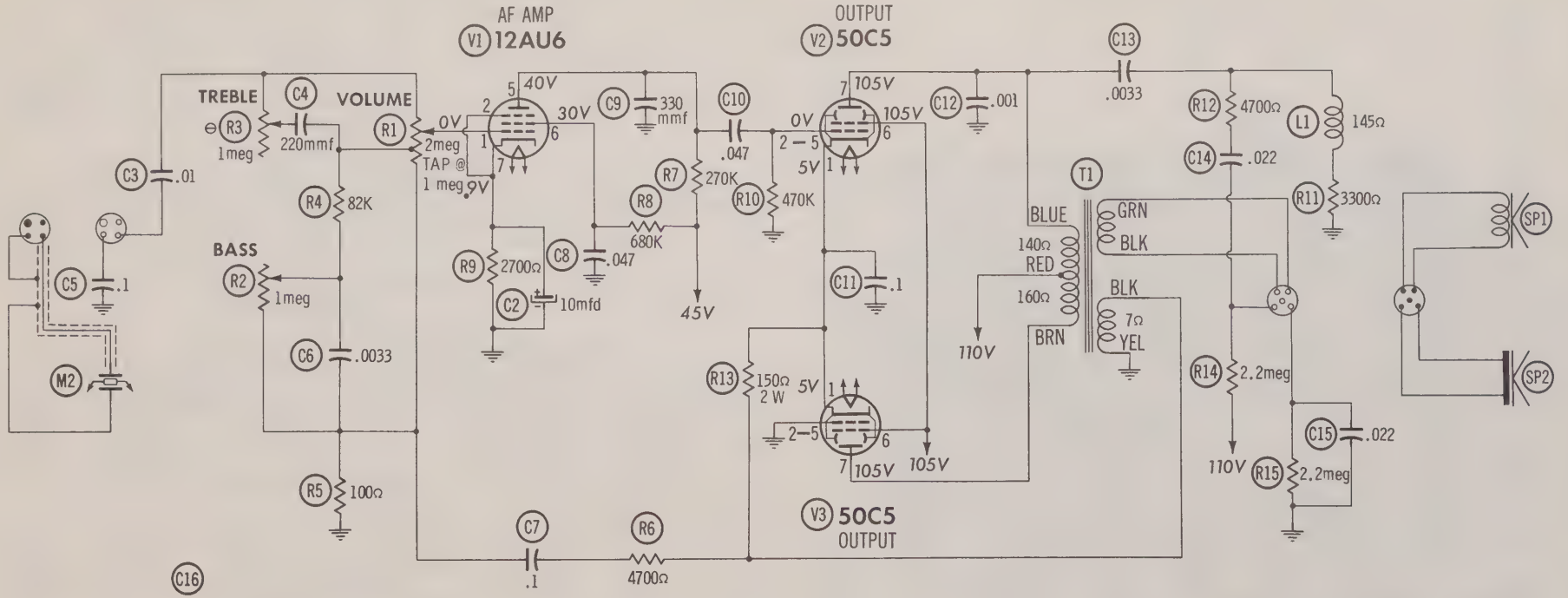
MISCELLANEOUS

ITEM No.	PART NAME	PHILCO PART No.	NOTES
	Knob	54-6313-2	Control (3 used)
	Handle	54-5211-12	
	Cabinet	11245	

CHASSIS—BOTTOM VIEW



PHILCO MODEL E-1360



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12AU6	100Ω	2700Ω	0Ω	12Ω	† 280K	† 690K	2700Ω
V2	50C5	150Ω	470K	60Ω	12Ω	470K	† 1000Ω	† 140Ω
V3	50C5	150Ω	0Ω	110Ω	60Ω	0Ω	† 1000Ω	† 160Ω

† MEASURED FROM OUTPUT OF M1

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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362-5

RETMA MEMBER

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

PHILCO
MODEL M-39

PHILCO
MODEL M-39

GENERAL INFORMATION

The Philco Record Changer Model M-39 is designed to play and automatically change a 1 inch stack of 7", 10", or 12" records, (provided they are of the same speed and same type groove) may be intermixed in any order.

Turntable Speed.....16, 33 1/3, 45, or 78 R.P.M.
Record Capacity.....1 inch stack of 7", 10", or 12" records

A single control is used to select the desired turntable speeds, starts a change cycle, and desengage the idler wheel while the unit is not in use to prevent the formation of flat spots on the idler wheel assembly surface. The center spindle incorporates a saftey pawl which prevents records from dropping to the turntable while the tone arm is in the playing position.

The model M-39 was designed to operate on 105 to 120 volts, 60 cycle A.C. only A direct connection to a D.C. line will result in damage to the phono motor.

Supplied by:
Philco Corporation
Tioga & "C" Streets
Philadelphia, Pa.

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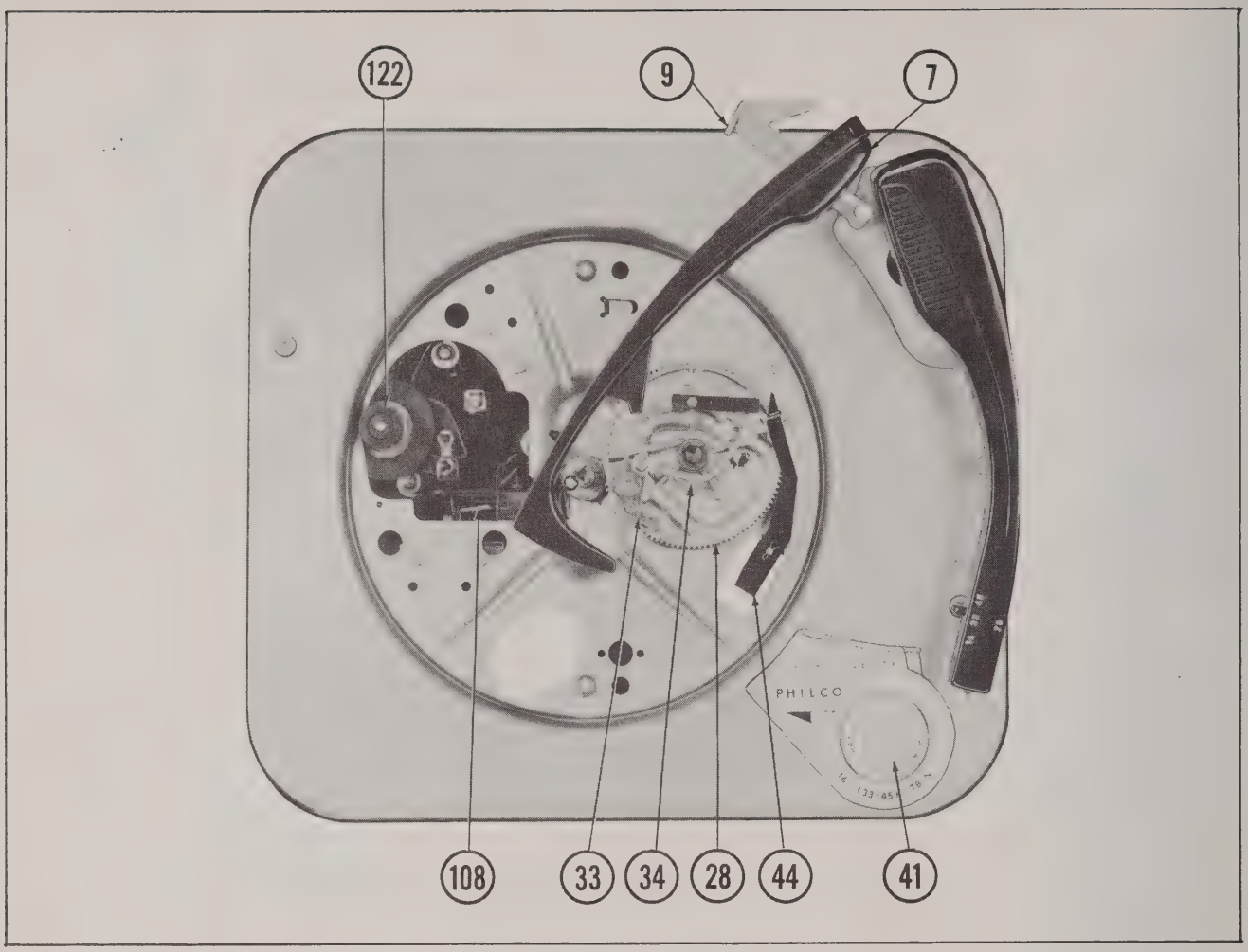

Figure 1

Preparing For Operation

Before placing in operation, the changer must be floating freely on its mounting springs. During shipment, the unit is secured by means of two shipping screws (one screw at the front and rear edge of the baseplate). Carefully remove cardboards which protect unit during shipment. Turn the two shipping screws in a clockwise direction until they are flush with the baseplate. The changer is now free-floating and ready for operation.

Operating Instructions

1. Release the tone arm from the tone rest.
2. Raise the front of the tone arm and remove the needle guard.
3. Lift record overarm and turn away from spindle until it locks in open position.
4. Place up to a 1" stack of records on the spindle. 7", 10", and 12" records may be intermixed so long as they are of the same speed.
5. While holding the records in place with one hand, swing record overarm toward spindle and lower it over the records.
6. Turn needle selector on tone arm to correct position for 16-33-45, or 78 R. P. M.
7. Turn the speed control to the speed which corresponds to the type records to be played, 16, 33, 45, or 78 R. P. M.
8. Depress the combination speed and reject control. Each record in the stack will play and be automatically changed until the last record is played, at which time, the tone arm returns to its rest position and the changer automatically shuts off.
9. To remove records, lift record overarm and swing away from spindle until it locks in open position using both hands, with fingers under the edge of bottom record, lift records straight up and off spindle.

Note: When the changer is not in use, be sure the the selector knob is in its neutral (N) position.

Change Cycle

Speed Change Mechanism —

The changer mechanism is driven by the motor (131) which transmits power to the turntable by means of idler wheel (122). Turntable speed is determined by the position of the wheel on one of the four steps of the drive shaft (129). When the Selector-Reject Knob is turned to the "16" position, the idler wheel contacts the smallest diameter portion of the drive shaft. As the idler wheel is lowered so that it is contacted by increasingly larger drive shaft diameters, it turns at faster speeds.

Starting The Motor And Change Cycle —

Line voltage is applied to the motor through the plunger-operated misroswitch (65). When the plunger is depressed, the switch is open, and the motor is not energized. When the plunger is released, the motor

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3924 MEADE ST.
DENVER, COLORADO

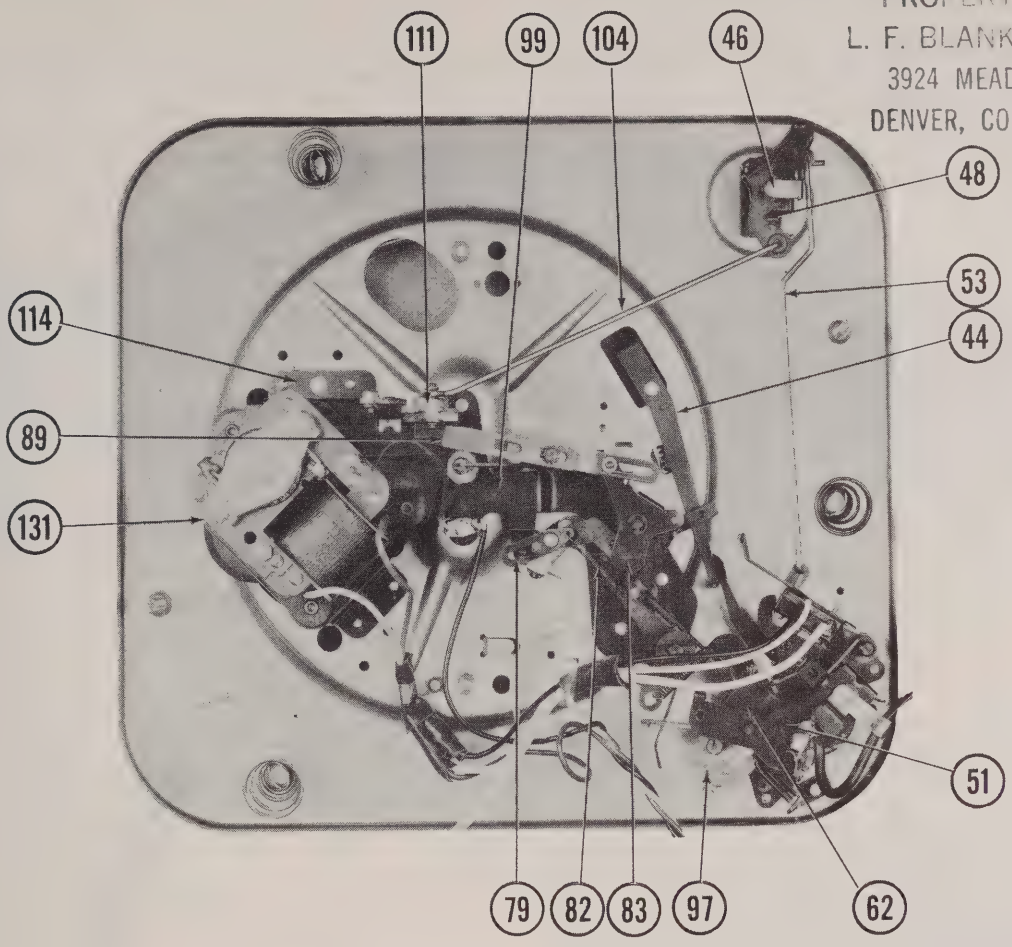


Figure 2

is engerized and the turntable will be driven by idler wheel (122).

When the reject knob (41) is depressed, the reject rod (53) moves the microswitch (65) from under the shutoff plate (59). This releases the switch plunger and closes the a-c circuit which energizes the motor and starts the turntable rotating.

Simultaneously, the flexible metal bar on switch bracket (64) contacts and applies pressure to the portion of trip bracket (44) which extends below the baseplate. This action causes the portion of trip bracket (44) which extends above the baseplate to contact and move the slide plate (34) in toward the spindle. This in turn, causes the projection on the hub of the turntable to contact the front edge of slide plate (34). Since the turntable is rotating, the contact between the front edge of slide plate (34) and turntable hub projection gives the necessary push for the teeth in main gear (28) to engage the teeth in the turntable hub, thus causing main gear (28) to rotate.

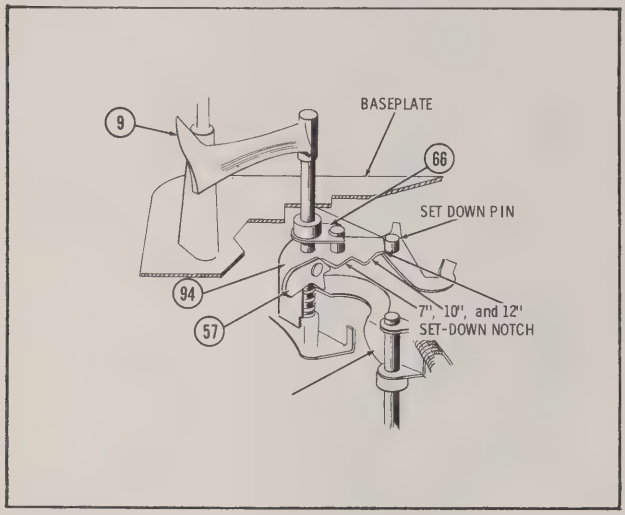
As main gear (28) starts its rotation, the stud on the end of raising lever (62) engages an eccentric groove in the underside of main cam (28). The motion imparted to the raising lever (62) by the eccentric groove causes the rear end of raising lever (62) to pivot upward and contact the lift plate (61). In turn, the lift plate friction pad lifts the shutoff plate (59), which raises the tone arm off its rest. As the shutoff plate (59) is raised, it clears the microswitch plunger and permits the microswitch and switch bracket (64) to be returned to their original position by action of torsion spring (54).

As the stop plate (59) raises, the bottom tooth on the bottom of record selector bracket pawl (57) engages a hook on the raising lever (62), so that pawl (75) and record size bracket (94) will follow the motion of raising lever (62).

At this time, the eccentric groove in the bottom of main cam (28) causes the rear end of raising lever (62) to pivot. As a result, stop plate (59) and record size bracket (94) are simultaneously rotated counterclockwise. During this rotation, the set down pin (located on top of the shutoff plate) swings clear of the record size bracket (94) and the shutoff plate (59) until the bracket stop ear (94A) hits the tone arm bracket (51). Consequently, the raising lever (62) moves out from under the record selector pawl (57) and the record size bracket (94) is permitted to drop. This brings the notched plate, located on the top of record size bracket (94), directly in line with the set down pin which is located on top of shutoff plate (59). As a result, the inward swing of the tone arm (toward the spindle) is stopped at the point where the set down pin contacts the notched plate. The exact position of the tone arm set down depends upon the particular record size bracket notch (94) engaged by the set down pin. This, in turn, is determined by the size of the bottom record on the spindle.

After the tone arm lands on the record and the mechanism reaches it out of cycle position, the veloc-

ity trip arm (58) moves inward toward the trip bracket (44) as the tone arm tracks toward the spindle. Near the end of the record the velocity trip arm (58) actually contacts the trip bracket (54), but velocity is insufficient to cause slide plate (34) to engage the turntable gear. When the tone arm follows the eccentric groove at the end of the record the movement of the velocity trip arm (58) increases and sufficient velocity for tripping action is applied to the slide plate (34).



Record Size Selection —

As the record size bracket (94) rotates at the beginning of the change cycle, the pin on top of bracket (94) rides within the fork of the semaphore link (66) and causes semaphore (9) to swing toward spindle. When pawl (57) disengages from raising lever (62), the record size bracket (94) drops so that its 7 inch set down notch is in position to block the set down pin which is located on top of shutoff plate (59). When the tone arm has reached its farthest outward travel, the bottom record will be pushed off the spindle shelf. If the record has a 7 inch diameter, it will clear the semaphore (9) as it drops to the turntable, and the porition of record size bracket (94) will not be changed. If, however, a 10 or 12 inch record drops off the spindle, it will hit against one of the sloping sides of the semaphore (9) and push it back toward its original position. A 10 inch record will push the semophore back approximately half way, while a 12 inch record will push it back to its starting place. This motion is transmitted to the record size bracket (94) and positions it to block the tone arm for the 10 or 12 inch set down point.

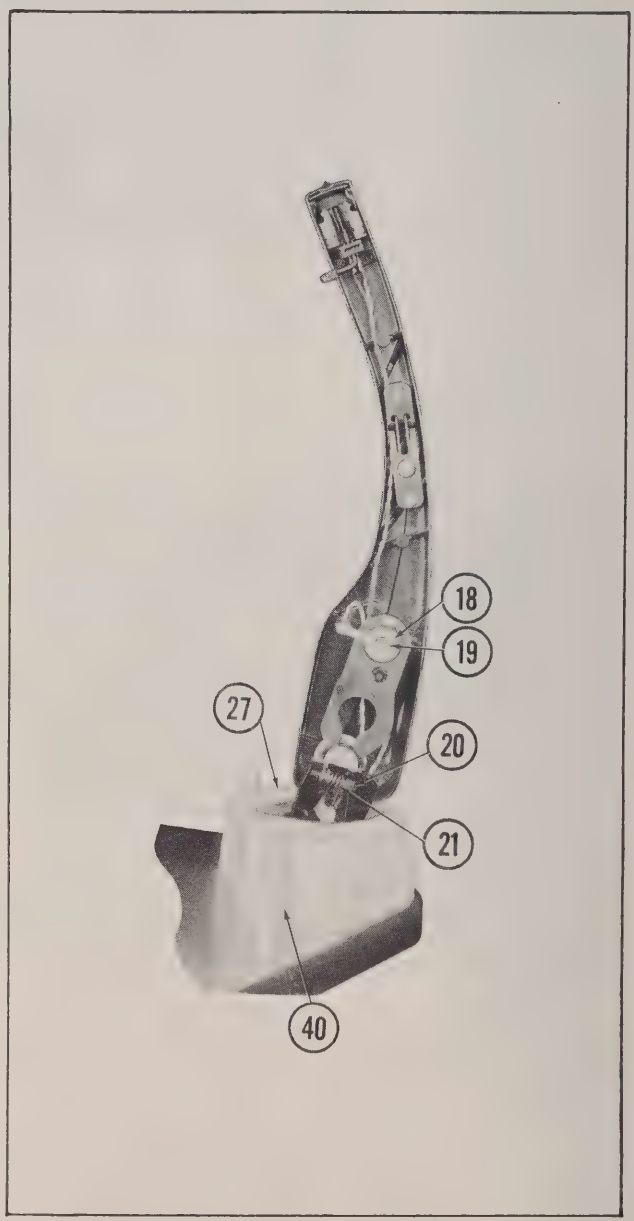
Record Push Off Mechanism —

The record push-off mechanism consists of a pre-assembled spindle (6) and a spindle lever and roller (101). The roller rides on the cam surface on the bottom of the main cam (28). As the main cam rotates, the roller is depressed, causing the opposite end of the spindle lever to force the spindle mechanism upward. When the spindle mechanism has reached its maximum upward position, the bottom record of the stack is pushed off the spindle and drops to the turntable.

Shut Off Operation After Last Record Is Played —

After the last record drops to the turntable, the overarm shaft depresses the lockout lever (97). This causes the lockout pawl (96) to be lowered until, after the last record has dropped, the bottom edge of pawl (98) is in a position to engage with the protrusion on the rear of shutoff plate (59) and prevent any inward motion of the shutoff plate during the change cycle. As a result, the tone arm will set down on the tone arm rest, causing the shutoff plate (95) to depress the switch plunger and shut off the motor.

The action of the pivot bracket lever (123) prevents the automatic shutoff operation before the last record has been played. While the last record of a stack is resting on the spindle shelf, the lock out lever (97) is held in a raised position by tension spring (72). As the changer goes into cycle, but before the last record is pushed from the spindle shelf, the pivot bracket lever (123) pivots under the lock out lever and prevents the weight of the overarm shaft from depressing lock out lever (97). After the last record has been played and the changer again goes into a change cycle, the weight of the overarm shaft depresses the lock out lever (97). In this position, the pivot bracket lever (123) pivots over the top of lock out lever (97) and permits the lock out pawl (96) to engage with the ear on shutoff plate (59) and block the inward movement of the tone arm.



TONE ARM ASSEMBLY

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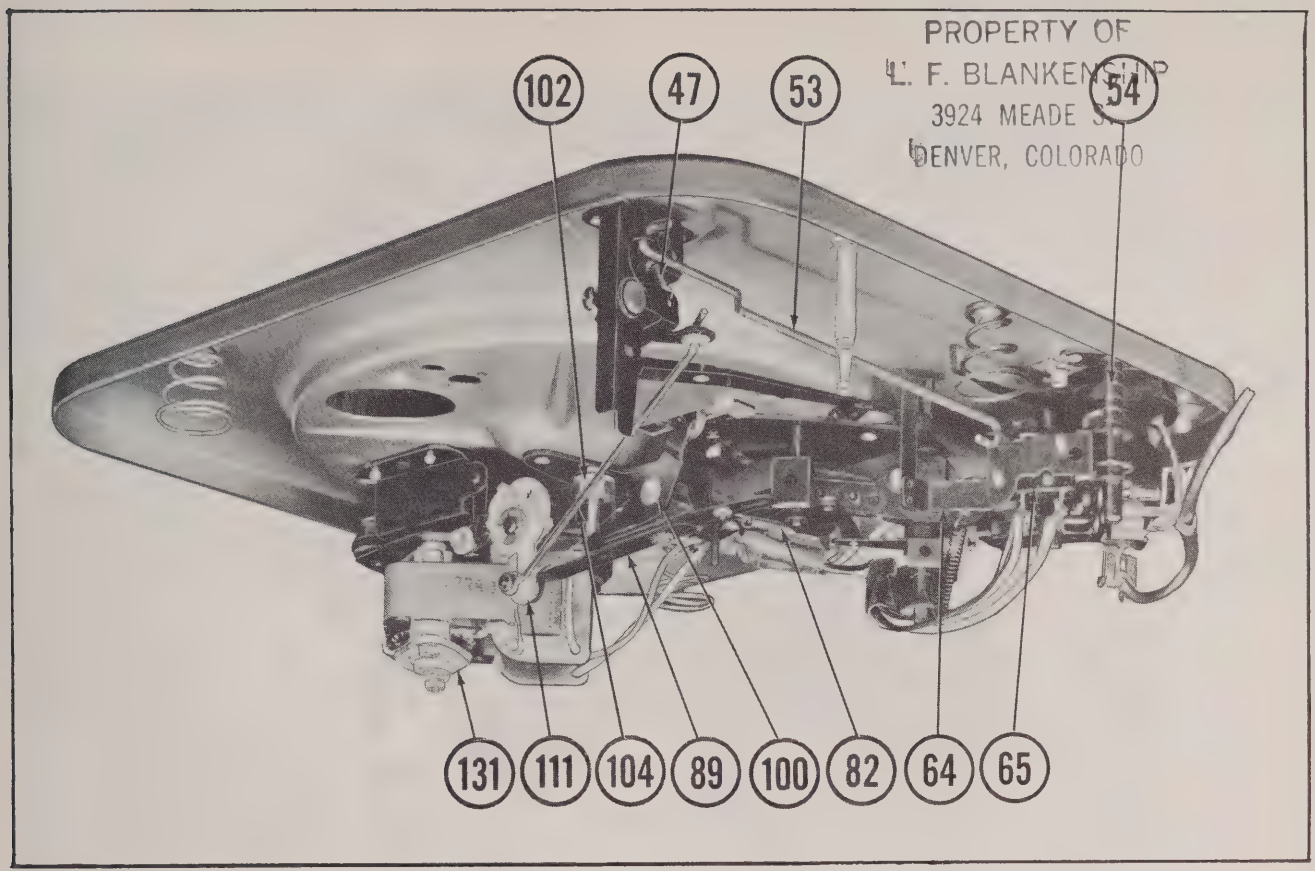


Figure 3

Adjustments

Tone Arm Shaft Assembly Adjustment —

The entire operation of the changer mechanism depends, to a large degree, upon the correct assembly of the tone arm shaft parts. Improper adjustment of these parts will indicate false symptoms elsewhere in the changer (i.e. height adjustment, indexing adjustment, etc.) when actually the trouble is caused by incorrect adjustment of the tone arm shaft and its associated parts.

Of the various parts assembled on the tone arm shaft (26), only the stop plate (59) is actually fastened to the shaft, with a #8 Bristol screw (60). As a result, any up and down or lateral movement of the stop plate is transferred to the tone arm. All other parts fit the tone arm shaft loosely and are permitted to rotate freely about the shaft.

The position and height at which the stop plate (59) is fastened to the tone arm shaft is of the utmost importance. Improper positioning of this assembly could result in no motor shutoff, incorrect tone arm set down, tone arm slide on record, no tone arm set-down on rest, continuous cycling, or any combination of these.

To simplify the correct positioning of stop plate (59), a small indentation has been drilled into the tone arm shaft. It is imperative that the set screw of the stop plate engage this indentiation and is securely tightened. With the stop plate so positioned, the occurance of any symptoms described above would be do to other causes.

Tone Arm Set-Down Adjustment —

Tone Arm set-down adjustment is required if indexing is correct (tone arm sets down in approximately the correct position for the record being played) but the needle does not land in the lead-in groove of the record. Adjustment is made by means of the set down adjusting screw (20) which is located in the tone arm hinge assembly. Adjust as follows:

1. With reject knob "N" position place a 7 inch record on the turntable and depress the reject knob.
2. Rotate the turntable by hand and observe the needle landing point.
3. If needle tends to set down outside of record, turn adjusting screw (20) counterclockwise to move tone arm toward spindle. If needle sets down too far toward the center of the record, turn screw (20) clockwise until the correct set-down point is obtained.

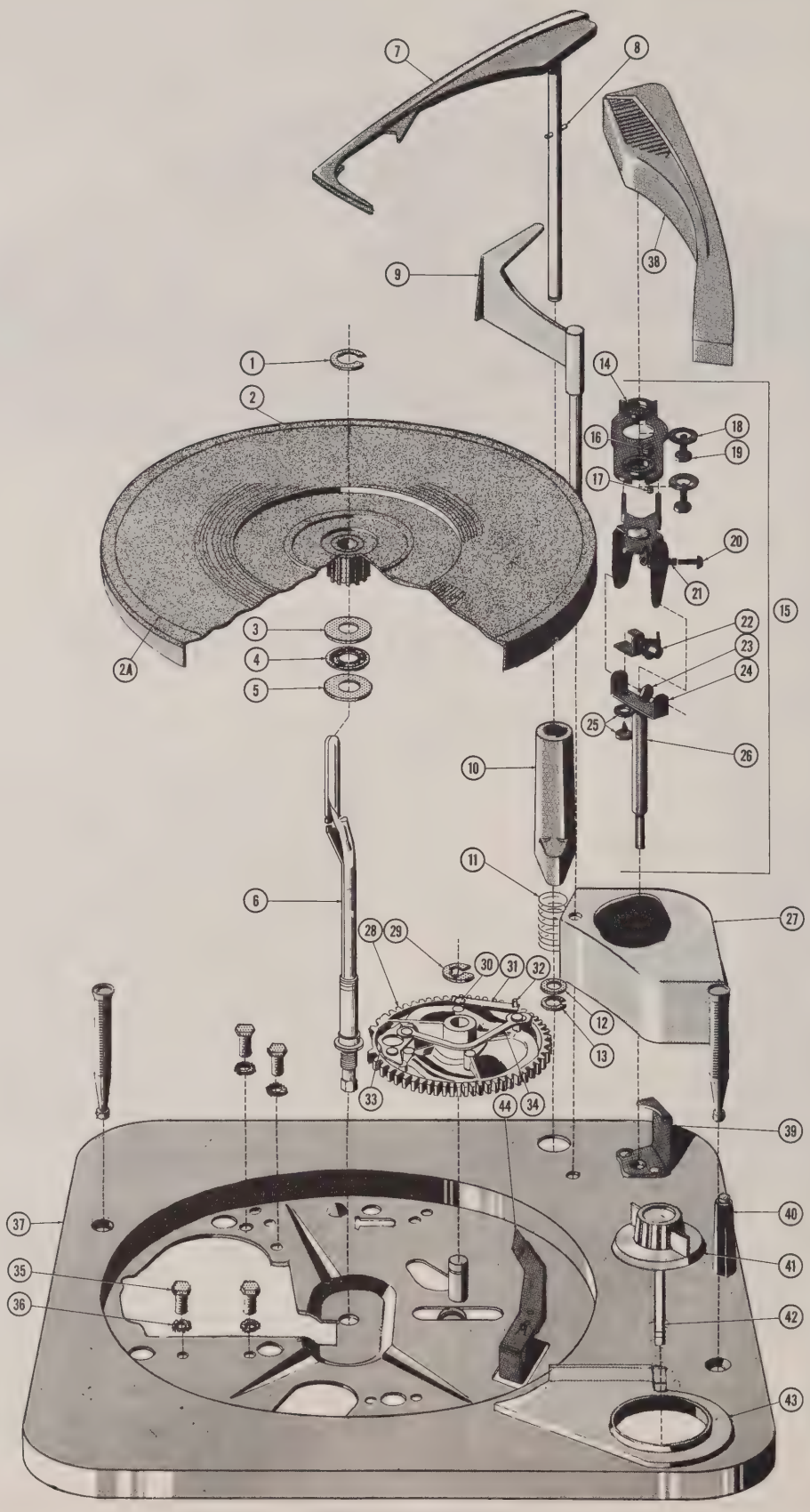
Stylus Pressure Adjustment —

Unless otherwise stated by the cartridge manufacturer, the stylus pressure should be between 8 and 11 grams for best results. Stylus pressure is adjusted by rotating the tone arm counterbalance stud (22). The stud can be rotated by inserting a small steel rod in the stud hole. Rotate the stud upward to decrease stylus pressure, or downward to increase stylus pressure.

Note: A slight movement of the stud has a relatively great effect on needle pressure. An accurate pressure gauge should be used to insure correct reading.

Semaphore Adjustment —

Adjustment of the semaphore (9) is required if it becomes necessary to replace the semaphore, if the semaphore link (66) has loosened during operation, or if erratic or improper indexing occurs. Adjustment



A PHOTOFACT "EXPLODED" VIEW
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Figure 4A. Exploded View of Parts Above Baseplate

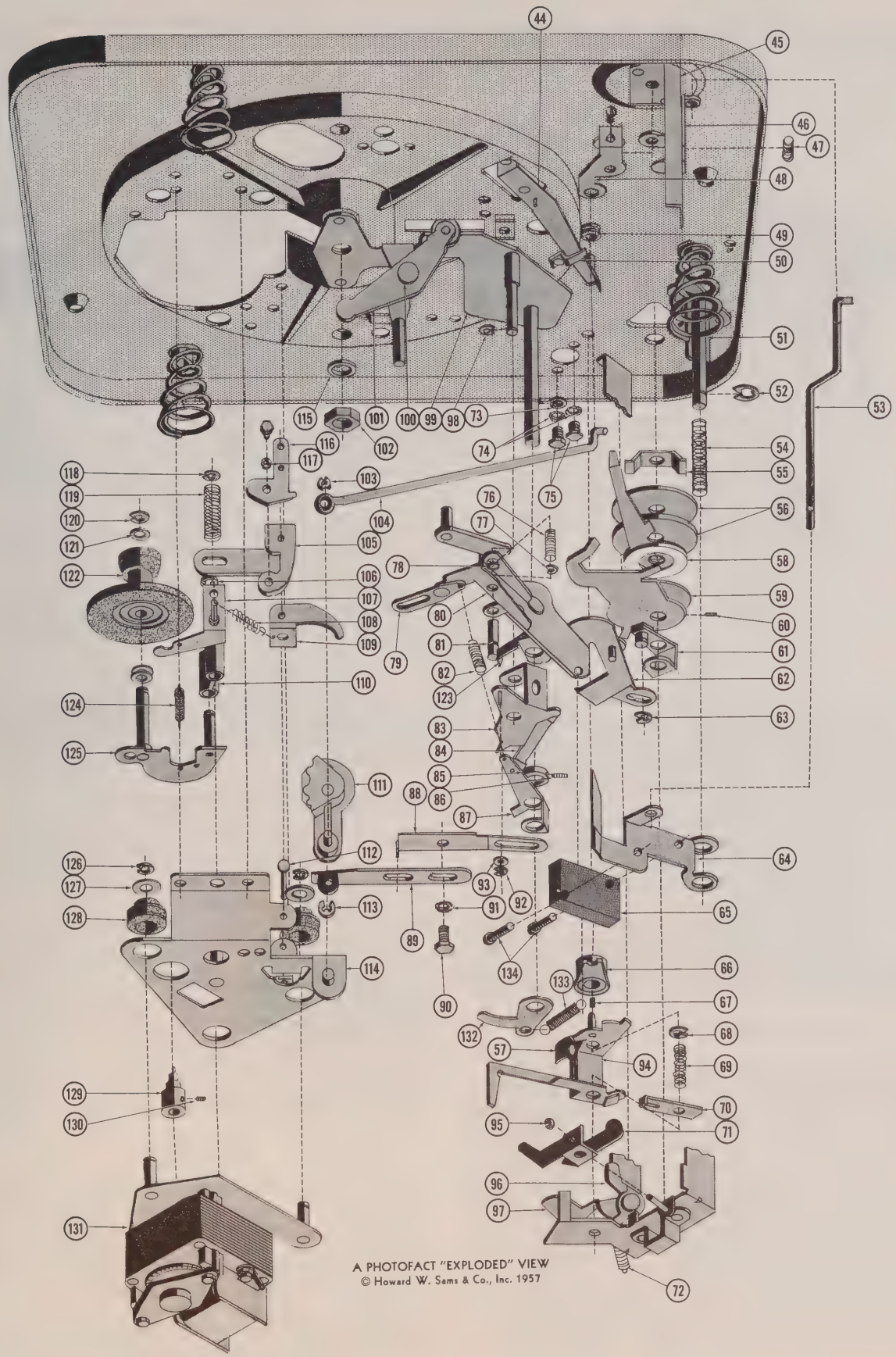


Figure 4B. Exploded View of Parts Below Baseplate

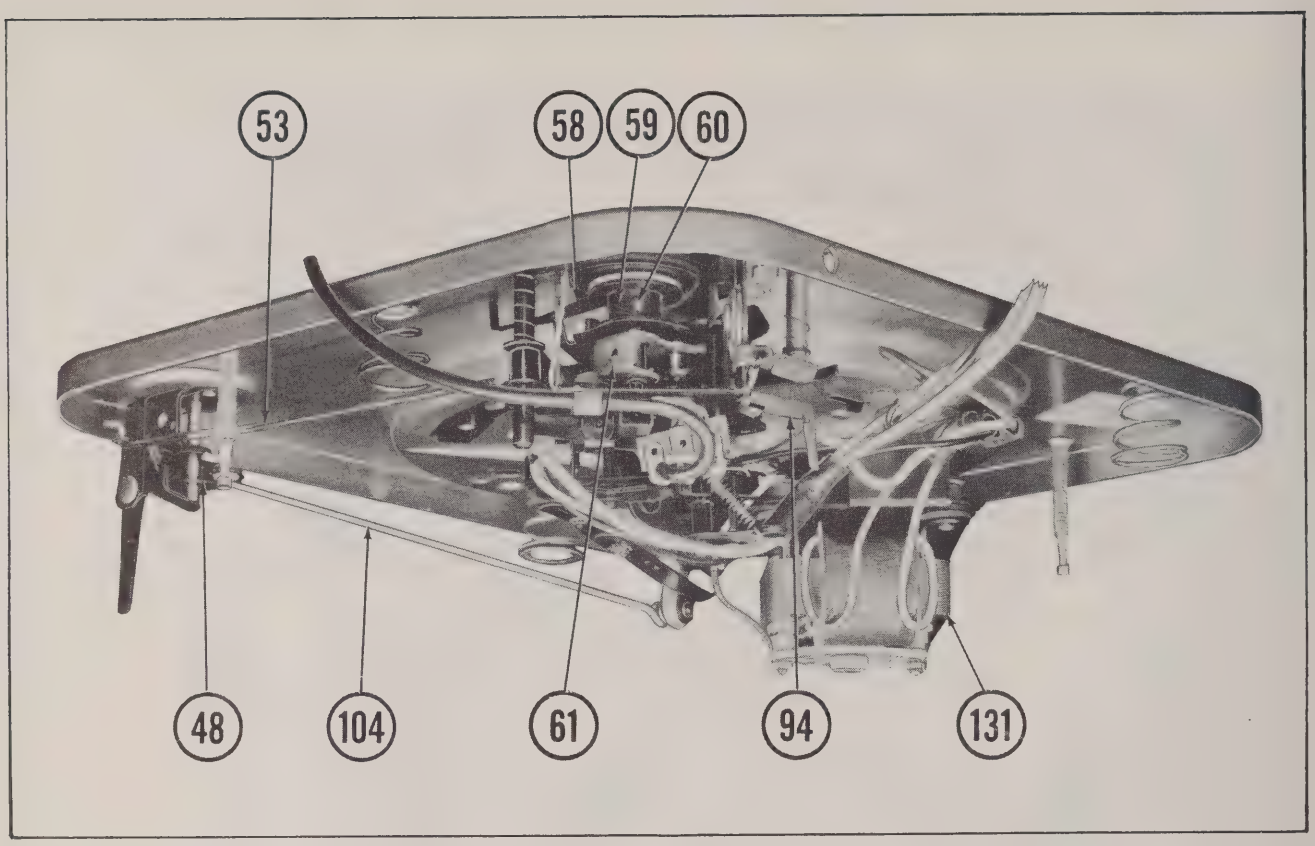


Figure 5

involves positioning of the semaphore link (66) on the shaft so that proper semaphore action is possible.

The link (66) is fastened to the semaphore shaft by means of set screw (67) which is accessable from the back of changer. Correct adjustment procedure is as follows:

1. Loosen set screw (67) and permit link (66) to drop until it rides on top of record size bracket (94).
2. With semaphore (9) hold firmly against the overarm housing (10), rotate record size bracket (94) clockwise as far as possible.
3. Lift semaphore link (66) until it is raised to within 1/64 inch of the underside of the main plate, and tighten set screw (67) securely so that link is fastened to semaphore shaft.

Velocity Trip Adjustment —

Improper adjustment of the velocity trip mechanism may result in failure of the automatic or reject trip lever to initate the change cycle, or could cause continuous cycling. To check this adjustment, or correct faulty adjustment, proceed as follows:

With tone arm on its rest, remove turntable and move slide plate (34) away from spindle as far as possible. Rotate trip bracket (44) until its bottom portion contacts the reject trip lever (64). In this position, the clearance between the top portion of trip bracket (44) and the slide plate lever (34) should be approximately 1/8 inch. If spacing is incorrect, bend the flexible portion of switch bracket (64) until proper clearance is obtained. Check trip bracket (44) to make sure that it does not rub against the main cam or baseplate.

To Replace Cartridge Or Needle —

To remove cartridge, procedure is as follows:

1. Raise tone arm to a vertical position and remove pickup lead lugs from cartridge terminals.
2. Remove two mounting screws and take cartridge from arm.

To replace needle proceed as follows:

1. To remove the needle, raise the tone arm and, while holding the tone arm with one hand, turn the needle selector toward the 78 r.p.m. position.
2. With the selector held at a slight angle to the normal 78 r.p.m. position, press the selector down toward the inside-rear of the tone arm. Turn the selector to the left until the front of the selector slips out from beneath the holder. Then with a little pressure, move the selector-and-needle assembly to the right and slide it from under the holder.
3. To replace the needle, place the needle selector along side the cartridge, and, with a slight inward pressure on the selector, slide the selector-and-needle assembly under the holder.

Lubrication

All Philco changers are completely lubricated before leaving the factory. Under normal conditions, this should be sufficient for approximately one year or 1000 hours of operation. However, when operated under extreme conditions of dust or heat the mechanism should be lubricated more often.

Caution: When lubricating the changer, do not permit oil or grease to come in contact with the idler wheel, motor drive shaft, turntable rim, slide plate lever (34), tone arm lockout lever (97), or lift plate friction pad (part of item (61). Any oil or grease on these parts

will prevent proper operation and should be be removed with alcohol.

The following parts should be lubricated with a light mechine oil, using a small oil can or a medicine dropper:

1. Motor bearing (1 drop).
2. Main cam bearing (1 drop).
3. Overarm shaft (1 drop).
4. Turntable bearing race (1 drop).

The following part should be lubricated with a non-fluid high temperature lubricant. Lubricant may be applied with a small brush.

1. Main cam eccentric groove.

Troubles And Probable Remedies

No Sound Output From Changer —

Disconnect leads from cartridge lugs and check output directly at cartridge. If output is normal, trouble is in the wiring and can be located by checking continuity with an ohmmeter. If there is no output from cartridge, check to see that stylus is correctly installed and is riding in record grooves. If this is normal, replace the cartridge.

Sound Is Distorted —

Check stylus pressure with an accurate guage. If pressure is normal (between 8 and 11 grams) replace stylus. If output is still distorted, replace cartridge.

Motor Starts But Turntable Does Not Rotate —

Remove turntable to expose idler wheel assembly (122). Turn reject knob to "78" position and check position of idler wheel. Wheel should be pressing against motor drive shaft. If it does not, check tension of spring (108). If spring is tight, check idler link and stud assembly (125) for binding. If it does bind, remove wheel from its shaft and clean shaft and wheel bushing.

Motor Does Not Start When Reject Knob Is Depressed —

Manually lift tone arm from tone arm rest and swing it towards spindle. If motor does not start, observe switch action as reject knob is depressed. If switch is not pushed out from under stop plate (59), so that plunger is released, check tone arm assembly as described under "Tone Arm Shaft Assembly Adjustment".

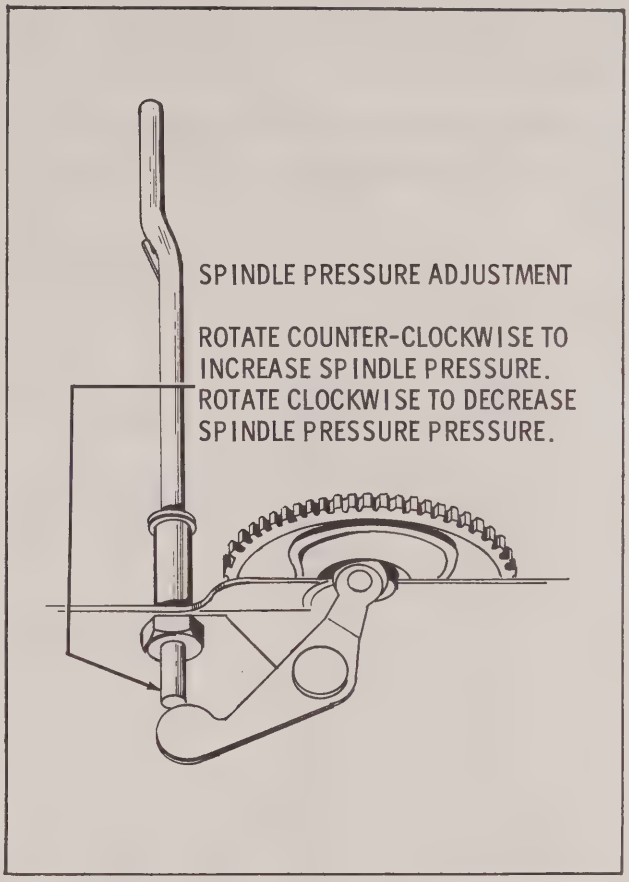
Change Cycle Does Not Start When Reject Knob Is Depressed —

Turn reject knob to "78" position. Check raising lever (62) to see that its guide pin is engaged in the eccentric groove in the bottom of main cam (28). Remove turntable and move slide plate (34) on main cam to make sure that it moves freely.

Depress reject knob and observe action of trip bracket (44) and slide plate (34). The trip bracket should push the slide lever toward spindle and maintain pressure on slide lever so that it can not move back on its own accord. If this condition does not exist, check to see that trip bracket (44) is not binding on the baseplate. Check trip adjustment as described under "Velocity Trip Adjustment."

Record Drops On Tone Arm As Arm Moves Toward Spindle —

Increase spindle pressure by turning spindle adjusting nut (located on bottom of spindle) counter-clockwise.


SPINDLE PRESSURE ADJUSTMENT
ROTATE COUNTER-CLOCKWISE TO INCREASE SPINDLE PRESSURE.
ROTATE CLOCKWISE TO DECREASE SPINDLE PRESSURE PRESSURE.

Record Drops On Tone Arm As Arm Moves Away From Spindle —

Decrease spindle pressure by turning spindle adjusting nut clockwise.

Improper Or Erratic Tone Arm Set Down —

Check semaphore (9) for nicks or warpage. Replace if necessary. Check semaphore adjustment as described under "Semaphore Adjustment".

Slow Or Erratic Speed —

Remove any dirt, oil or grease from the idler wheel, motor drive shaft and turntable rim with alcohol. Check idler wheel for a smooth shiny surface. If this condition exists it can cause slip-page. If necessary, replace idler wheel.

Check idler wheel position against motor drive shaft. If wheel is tilted so that only the edge is pressing against the drive shaft, the idler wheel stud may be bent, and should be straigntened so that entire surface of idler wheel rim contacts the drive shaft.

Place the reject knob in "N" position and turn the turntable by hand to see if the turntable turns easily. If not, clean the turntable bearings and re-lubricate.

Rotate the motor shaft by hand to see if the motor bearings bind. If so, lubricate as described under "Lubrication."

If none of the above conditions exist, replace the motor.

Changer Stalls During Cycle –

Check line voltage. Voltage should be no less than 105 volts. Remove turntable and clean idler wheel and inner turntable rim with alcohol. If ilder wheel has a worn surface, it should be replaced. Rotate main cam (28), by hand, in a clockwise direction. If cam will not rotate completely without undue force being applied, check for binding in the mechanism.

Creaking Or Groaning Noise During Change Cycle –

If lift plate (61) friction pad is rough it will cause excessive friction between the pad and stop plate (61). Rub with wax crayon that portion of stop plate (61) which comes into contact with pad. Smooth operation will result after following this procedure.

With Records On Spindle, Tone Arm Set Down On Rest –

Replace defective or missing lockout tension spring (72). If lockout lever (97) does not pivot about its rivet, clean with alcohol. If changer still does not operate satisfactorily, check the tone arm assembly as described under "Tone Arm Shaft Assembly Adjustment."

Mechanical Parts List

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
1	28-11628	Turntable Clip	39	35-8053-52	Lift Stop Bracket
2	35-8053-106	Turntable and Mat Assy.	40	54-9954	Tone Arm Rest, Lustre Ivory
2A		Turntable Mat		54-9954-1	Tone Arm Rest, Charcoal
3	35-8053-100	Washer Bearing Race (Top)	41	54-9957	Selector Reject Knob, Lustre Ivory
4	35-8053-102	Turntable Bearing Race		54-9957-1	Selector Reject Knob, Charcoal
5	35-8053-103	Washer Bearing Race (Bottom)	42	35-8053-44	Reject Knob Shaft
6	76-11302	Spindle	43	54-9956	Needle Guard-Name Plate, Lustre Ivory
7	76-11301	Overarm		54-9956-1	Needle Guard-Name Plate, Charcoal
8		Overarm Pin (Part of Item 7)	44	35-8053-105	Trip Bracket Assy.
9	54-9953	Semaphore, Lustre Ivory)	45	35-8053-35	Reject Bracket
	54-9953-1	Semaphore, Charcoal	46		Part of Reject Bracket (Part of Item 45)
10	28-11640	Overarm Housing	47		Reject Tension Spring
11	35-8053-88	Overarm Compression Spring	48	35-8053-16	Selector Link Assy.
12	35-8053-97	Overarm Shaft Washer	49		Selector Link Grommet (Part of Item 48)
13	35-8053-98	Overarm "C" Washer	50		Part of Baseplate
14	35-8053-61	Hinge Mounting Grommet	51	35-8053-90	Forearm Bracket Assy.
15	35-8053-67	Forearm Hinge & Shaft Assy. Includes reference numbers 14 thru 26.	52	35-8053-78	"C" Washer
			53	35-8053-35	Reject Rod
16	35-8053-59	Height Adj. Screw	54	35-8053-88	Torsion Spring
17	35-8053-60	Height Screw Insert, rubber	55	35-8053-43	Friction Spring
18	35-8053-62	Forearm mtg. Washer (2 used)	56	35-8053-42	Forearm Weight (2 used)
19	35-8053-64	Forearm mtg. Screw (2 used)	57		Record Size Bracket Pawl (Part of Item 94)
20	35-8053-66	Set Down Adj. Screw	58	35-8053-40	Velocity Trip Arm
21	35-8053-65	Set Down Adj. Compression Spring	59	35-8053-38	Plate & Set Screw
22	35-8053-55	Tone Arm Counterbalance	60	35-8053-39	Set Screw
23	35-8053-58	Hex Nut, Pivot Screw Adj. Lock	61	35-8053-37	Lift Plate & Pad
			62	35-8053-83	Cam Lever & Pin Assy.
24	35-8053-57	Pivot Screw	63	35-8053-76	"C" Washer
25	35-8053-56	Tone Arm Shaft Screw	64	35-8053-84	Switch Bracket Assy.
26	35-8053-54	Tone Arm Shaft	65	35-8053-85	A.C. Switch
27	54-9951	Tone Arm Housing, Lustre Ivory	66	35-8053-91	Link
			67	35-8053-92	Link Set Screw
	54-9951-1	Tone Arm Housing, Charcoal	68	35-8053-75	"C" Washer, Semaphore Latch
28	35-8053-49	Main Cam	69	35-8053-94	Compression Spring Semaphore Latch
29		"C" Washer	70	35-8053-93	Semaphore Latch
30		Drive Screw Main Cam	71	35-8053-89	Switch Actuating Bracket
31		Detent Spring, Main Cam	72	35-8053-36	Tension Spring, Forearm Bracket
32		Detent Plunger, Main Cam	73	35-8053-75	"C" Washer, Selector Bracket Mtg.
33		Slide Plate Ear	74		Lockwashers (2 used)
34		Slide Plate & Lever, Main Cam	75	35-8053-99	Overarm Housing Mounting Screws (2 used)
35		Motor mounting Screw			
36		Washer			
37		Baseplate			
38	28-11625	Tone Arm			

Mechanical Parts List (Con't)

Ref. No.	Part No.	Description
76	35-8053-31	Compression Spring, Pin Bracket
77	35-8053-80	"E" Washer
78	35-8053-79	Washer, Pin Bracket
79		Spring Guide Lug (Part of Item 62)
80		Pin Bracket (Part of Item 62)
81	35-8053-30	Retracting Pin, Pin Bracket
82	35-8053-29	Tension Spring, Pivot Bracket
83	35-8053-81	Shift Arm
84		Connector Link (Part of Item 83)
85	35-8053-33	Collar & Set Screw
86		Set Screw (Part of Item 85)
87		Selector Bracket (Part of Item 83)
88	35-8053-18	Shift Link
89	35-8053-17	Shift Link Extension
90	35-8053-19	Shift Link Adj. Screw
91		Lockwasher
92		"E" Washer
93		Washer
94	35-8053-34	Record Size Bracket Assy.
95	35-8053-76	"C" Washer, Switch Actuating Bracket
96		Lockout Pawl (Part of Item 51)
97		Lockout Lever (Part of Item 51)
98	35-8053-75	"E" Washer, Shift Arm Mounting
99	35-8053-82	Stiffener Assy. (99 includes 100 and 101)
100		Rivet Spindle Lever (Part of Item 99)
101		Spindle Lever & Roller (Part of Item 99)
102	35-8053-23	Nut, Spindle Mounting
103	35-8053-80	"C" Washer, Speed Change Rod (2 used)
104	35-8053-15	Speed Change Rod
105	35-8053-11	Yoke Lever
106	35-8053-76	"C" Washer, Connecting Link
107	35-8053-7	Yoke & Pin Assy.
108	35-8053-10	Tension Spring, Yoke Lever
109	35-8053-12	Push Lever
110	35-8053-6	Connecting Link
111	35-8053-14	Cam & Pin Assy.
112	35-8053-13	Pin, Yoke Lever
113	35-8053-78	"C" Washer, Cam & Pin Assy.
114		Motor Mounting Plate
115	35-8053-22	Lockwasher, Spindle Mounting
116		Speed Detent Arm
117		Lockwasher
118	35-8053-76	"C" Washer, Yoke
119	35-8053-9	Compression Spring, Yoke
120	35-8053-75	"C" Washer, Idler Wheel
121	35-8053-109	Fibre Washer, Idler Wheel (2 used)
122	35-8053-3	Idler Wheel Assy.
123		Pivot Bracket (Part of Item 62)
124	35-8053-8	Tension Spring, Idler Wheel
125	35-8053-5	Idler Link & Stud Assy.
126	35-8053-2	"C" Washer, Motor Mounting (3 used)
127	35-8053-74	Washer, Motor Mounting (3 used)
128	35-8053-1	Grommet, Motor Mounting (3 used)
129	35-8053-4	Driver Pulley With Set Screw
130		Set Screw
131	35-2768	Motor, Complete with Studs & Mounting Plate. All Models except E-1766
	35-2766	Model E-1766, Motor

PHOTOFACT* Folder

*TRADE MARK

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TRADE NAME	Philco	MODELS	CHASSIS
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		UE4802M, L, UE4804L	7L45U, AU
		E6200, E6204M, L, E6602L, M, T, TL, E6604L, M, T	7P50, A
		UE6200, UE 6204M, L, UE6602L, M, T, TL, UE6604L, M, T	7P50U, AU
			7P51, A,
			7P51U, AU

MANUFACTURER	Philco Corp., Tioga & "C" Streets, Philadelphia, Pa.
TYPE SET	Television Receiver
TUBES	Sixteen
POWER SUPPLY	110-120 Volts AC, 60 Cycle RATING 175 Watts, 1.6 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

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PHOTOFACT* Folder
*TRADE MARK

PHILCO CHASSIS 7L40, A, AU, U, 7L41, A, AU, U, 7L45AU, U, 7P50, A, AU, U, 7P51, A, AU, U

PROPERTY OF
F. BLANKENSHIP
3924 MEADE ST.
DEN[illegible]

MODEL E4206S (Ch. 7L40)

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 3 push-on type control knobs from the front, 2 metal screws, the escutcheon and 4 more push-on type control knobs.

2. Remove 8 wood screws and the rear cover.

3. Remove 2 speaker leads, picture tube socket, ion trap, yoke clamp, yoke, HV lead and ground lead.

4. Remove 2 wood screws holding the top chassis brace to the rear of the cabinet.

5. Remove 3 chassis bolts from the bottom.

6. Remove the chassis.

7. To remove the speaker it is necessary to remove the chassis and 4 speaker nuts.

MODELS	CHASSIS
E4204, L, E4206S, SL, STM, E4207SC, E4600, E4602, L,TL, TM, E4604, HM, E4608, E4610N, E4612G, E4614S, SL, E4700N	7L40, A
UE4204, L, UE4206SL, STM, UE4207SC, UE4600, UE4602, L, TL, TM, UE4604, HM, UE4608, UE4610N, UE4612G, UE4614S, SL, UE4700N	7L40U, AU
UE4802M, L, UE4804L	7L45U, AU
E6200, E6204M, L, E6602L, M, T, TL, E6604L, M, T	7P50, A
UE6200, UE6204M, L, UE6602L, M, T, TL, UE6604L, M, T	7P50U, AU
	7P51, A, U, AU

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustment of the VHF oscillator is possible by removing the channel selector and fine tuning knobs. Set the fine tuning at the center of its range. The adjustments (located in a circle around the shaft) should be made in sequence from the highest to the lowest channel in the area. Channel 13 adjustment is located at 9 o'clock, proceed in a counter clockwise direction adjusting for best picture and sound.

PICTURE TUBE SAFETY GLASS CLEANING

Remove 3 wood screws holding the trim at the top of the safety glass. Remove the trim and safety glass.

SPECIAL ADJUSTMENTS

A. Focus
The focus may be varied by the position of a strap on the base of the picture tube. The strap can be connected between pins 6 and 2 or 6 and 10. Readjust the Ion trap for the best focus consistent with maximum brightness.

B. Height, Vertical Linearity And Horizontal Hold Aux. Controls are accessible by removing the On-Off-Volume knob, 2 wood screws and the escutcheon. For location see tube placement chart.

C. Width Link
A width link is provided which shorts out one of the horizontal output tube screen resistors (R80). Width may be increased by connecting the link. (For location see tube placement chart).

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Set the horizontal hold control at the center of its range and adjust the horizontal hold aux. control until the picture synchronizes horizontally. (For location see tube placement chart).

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the discriminator secondary (A9) located on top of chassis.

FUSES

One fuse is used for LV power supply protection. (For location see tube placement chart).

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

PHILCO CHASSIS 7L40, A, AU, U, 7L41, A, AU, U, 7L45AU, U, 7P50, A, AU, U, 7P51, A, AU, U

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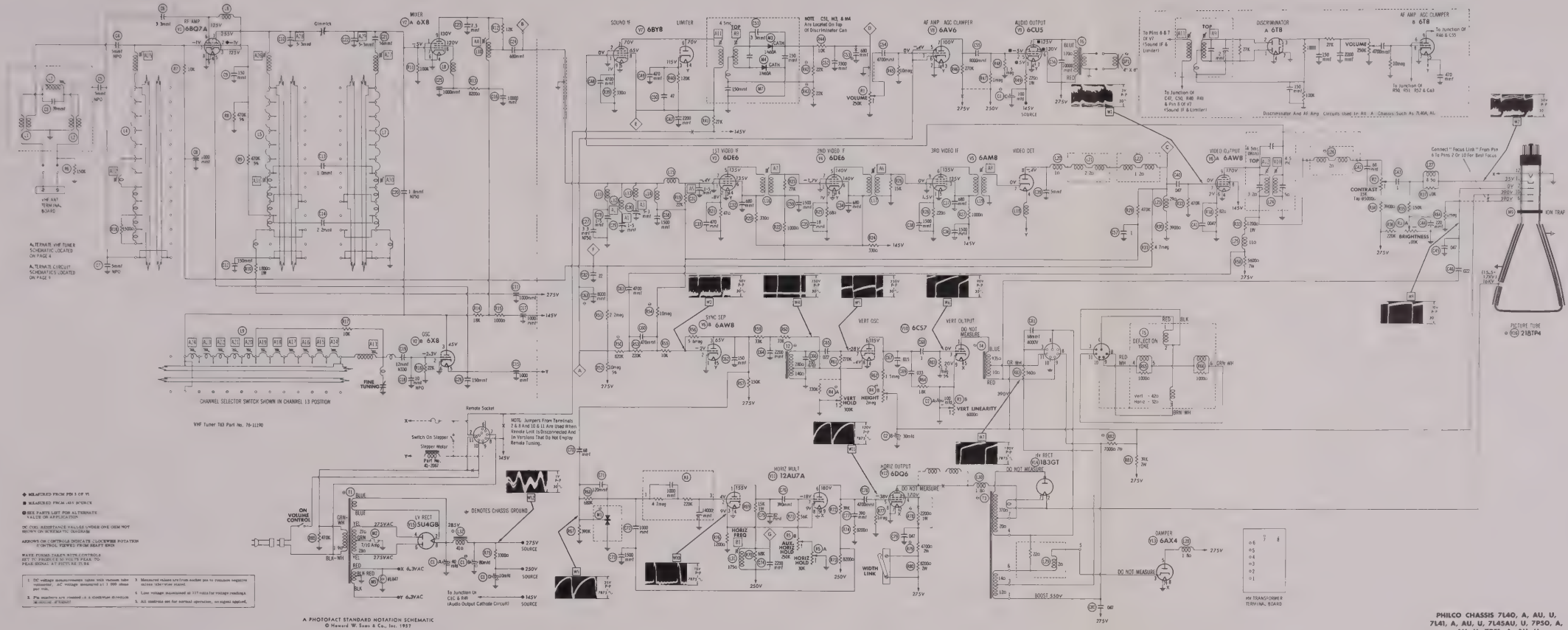

PHILCO CHASSIS 7L40, A, AU, U, 7L41, A, AU, U, 7L45AU, U, 7P50, A, AU, U, 7P51, A, AU, U

TUBE PLACEMENT CHART

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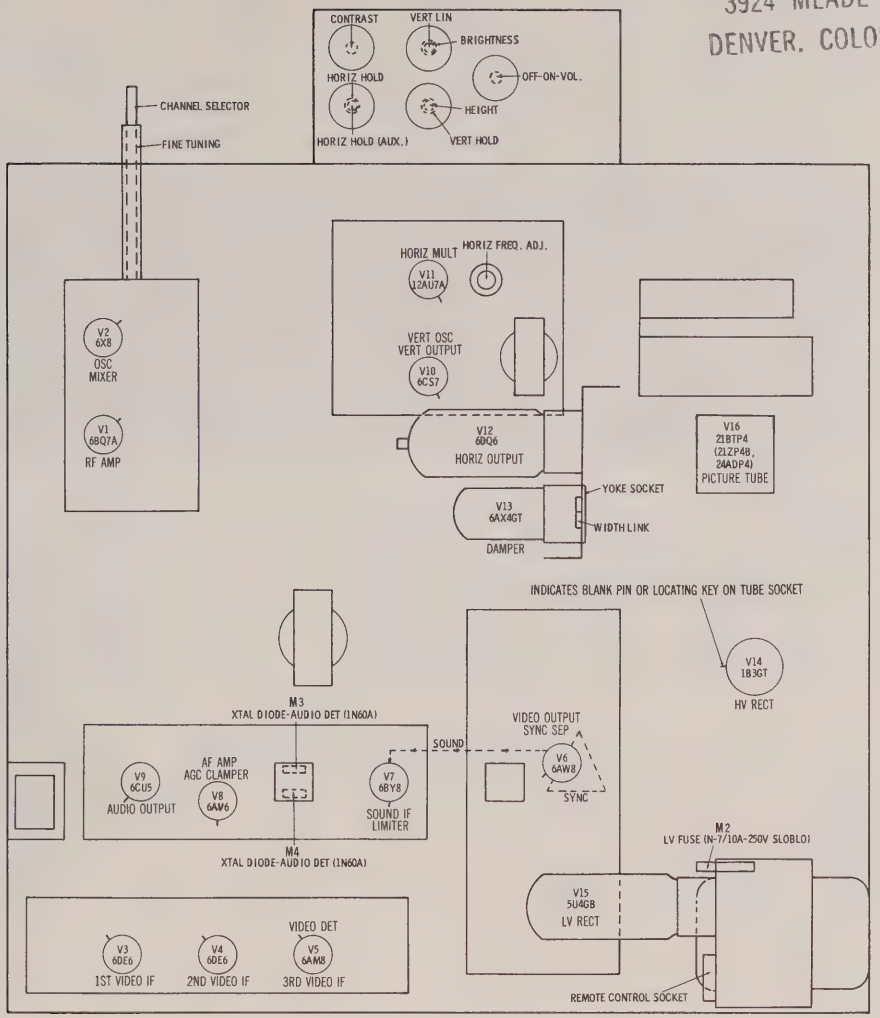


TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

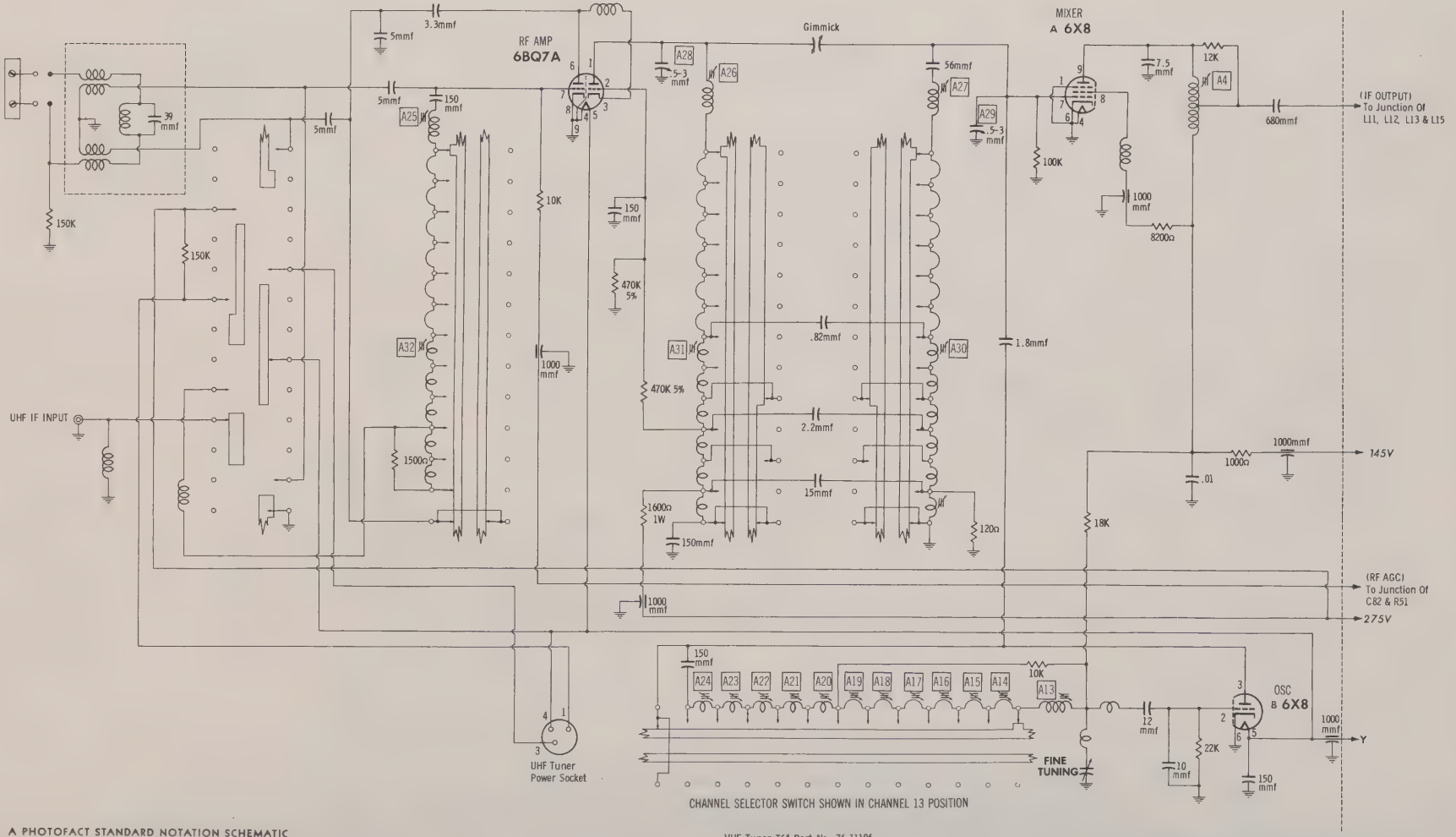
POWER SUPPLY FAILURE
No raster, no sound - Fuse (M2), V15

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V3, V4, V5, V6, V9
No pic, no sound, has snow - V1, V2, V9
No pic, has sound, has raster - V6, V16, V9
Has pic, no sound - V7, Diode (M3, M4), V8, V9

SYNC FAILURE
No vert. sync - V6
No horiz. sync - V6, Diode (M1)
No vert. or horiz. sync - V6

SWEEP FAILURE
No raster, has sound - Diode (M1), V11, V12, V13, V14, V16
No vertical deflection - V10
Poor vert. linearity or foldover - V10
Poor horiz. linearity or foldover - V11, V12, V13
Narrow picture - V11, V12, V13, V15
Vert. off freq. - V10
Horiz. off freq. - V11

PHILCO CHASSIS 7140, A, AU, U, 7141, A, AU, U, 7145AU, U, 7P50, A, AU, U, 7P51, A, AU, U



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VHF Tuner T64 Part No. 76-11106

ALTERNATE TUNER SCHEMATIC

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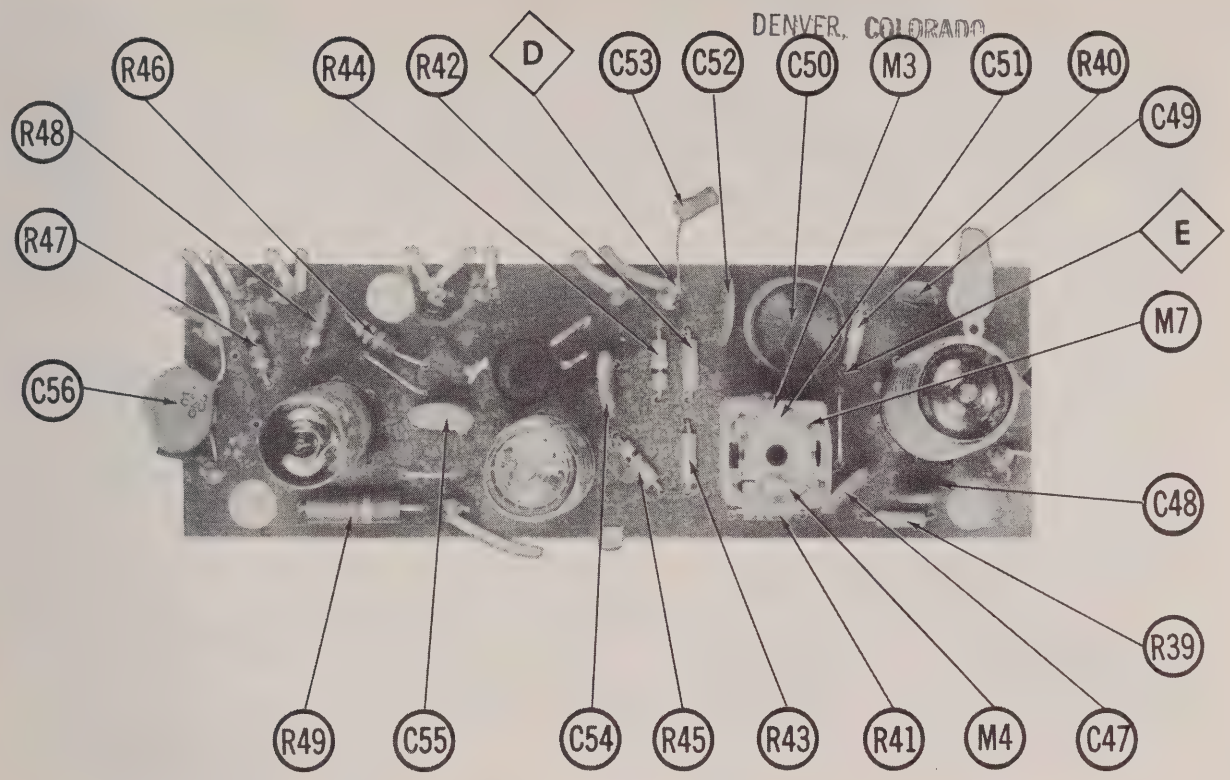
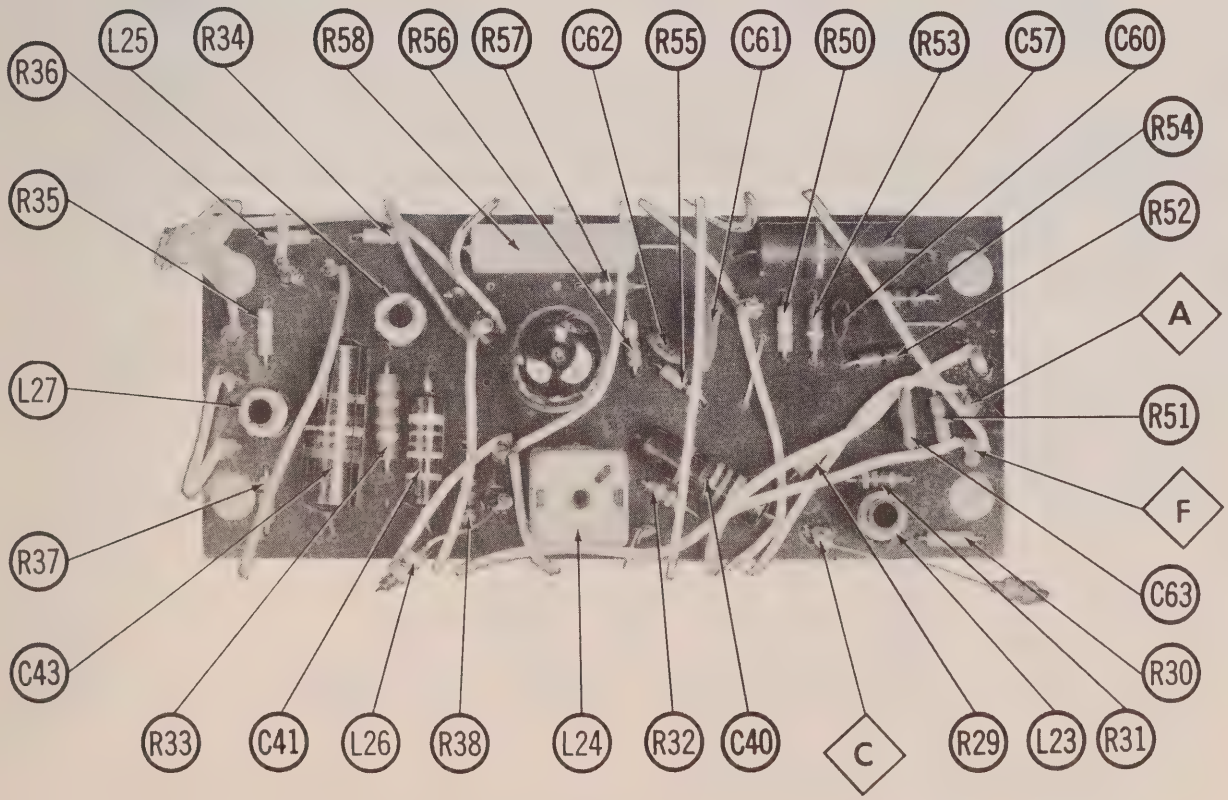


SOUND IF PRINTED BOARD



VIDEO OUTPUT PRINTED BOARD

SET 362 FOLDER 7

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Allow a 20 minute warm-up period for the receiver and test equipment.
There must be a good bond between test equipment and receiver. Connect the deflection yoke and speaker during alignment. The IF shield must be in place during alignment.
The High Voltage lead should be securely taped and kept away from the chassis.

VIDEO IF ALIGNMENT

Connect the negative lead of a 5 volt bias supply to point Ⓐ. Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	High side to point Ⓑ. Low side to chassis.	Not used	41.25MC (400∿ 30% Mod)	Any non-interfering channel	Vert. Amp. thru 10K to point Ⓒ. Low side to chassis.	A1	Adjust for MINIMUM indication on scope.
2.	"	"	"	47.25MC (400∿ 30% Mod)	"	"	A2, A3	"
3.	"	"	"	45.75MC (400∿ 30% Mod)	"	"	A4	Use only enough sweep generator output to provide usable pattern on scope. Adjust for maximum scope indication.
4.	"	"	"	42.7MC (400∿ 30% Mod)	"	"	A5, A6	"
5.	"	"	"	45.0MC (400∿ 30% Mod)	"	"	A7	"
6.	"	"	"	44.4MC (400∿ 30% Mod)	"	"	A8	"
7.	Two 120Ω Carbon Resistors	Across VHF antenna terminals with 120Ω in each lead.	"	65.75MC (400∿ 30% Mod)	"	"		Adjust fine tuning for MINIMUM.
8.	"	"	69.0MC (6MC Swp)	67.25MC 70.5MC	"	"		Check for response curve for curve limits and marker positions as in Fig. 1. If necessary, readjust A4 and A7 for proper curve level. A8 to level top of curve and A6 for proper slope on low frequency side of curve.

SOUND IF ALIGNMENT

Use only enough generator output to provide usable indication on VTVM.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
9.	.001MFD	High side to point Ⓒ. Low side to chassis.	4.5MC (400∿ 30% Mod)	Any non-interfering channel	DC probe to point Ⓓ. Common to chassis.	A9	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting. It is possible to obtain 2 zero readings. Use the one with the peak furthest counter clockwise.
10.	"	"	"	"	DC probe to pin 3 (cathode) of 6BY8 (V7). Common to point Ⓔ	A10, A11	Adjust for maximum deflection. Reduce signal to maintain a reading of less than 40 volts. When adjusting A11, use peak furthest clockwise. Repeat step 9.

4.5MC TRAP ALIGNMENT

Use a 4.5MC detector similar to Fig. 2. Before aligning the trap, connect the detector to an accurate source of 4.5MC signal and adjust the coil slug for maximum DC voltage output.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
11.	.001MF D	High side to point Ⓒ. Low side to chassis.	4.5MC (400∿ 30% Mod)	Any non-interfering channel	DC probe thru detector (Fig. 2) to pin 11 (cathode) of picture tube. Common to chassis.	A12	Adjust for MINIMUM deflection on VTVM.

VHF OSCILLATOR ALIGNMENT

Connect the negative lead of a 1.5 volts bias supply to point Ⓕ. Positive to chassis.
Set the fine tuning control to the center of its range.
Use only enough sweep generator output to provide usable pattern on scope.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	Direct	Across VHF antenna terminals.	257MC	13	Vert. Amp. thru 10K to point Ⓑ (for sets using tuner #T-64, connect to IF output lead from tuner). Low side to chassis.	A13	Adjust for zero beat on scope. If regeneration occurs, increase bias up to 5 volts, if necessary.
			251MC	12		A14	
			245MC	11		A15	
			239MC	10		A16	
			233MC	9		A17	
			227MC	8		A18	
			221MC	7		A19	
			129MC	6		A20	
			123MC	5		A21	
			113MC	4		A22	
			107MC	3		A23	
			101MC	2		A24	

ALIGNMENT INSTRUCTIONS (cont)

VHF RF AND MIXER ALIGNMENT

Disconnect the tuner output cable from the video IF strip and terminate cable with a 40 to 70 ohm resistor.
Connect bias as under "VHF Oscillator Alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
13.	Two 120Ω Carbon Resistors	Across VHF antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	210MC 216MC	13	Across terminating resistor placed across tuner output cable.	A25	Adjust for maximum response curve amplitude between markers.
14.	"	"	"	213MC	"	"	A26, A27	Adjust for response similar to Fig. 3. Adjust A26 to set carrier level, then adjust A27 for proper tilt.
15.	"	"	177MC (10MC Swp)	177MC	7	"	A28, A29	Check for response indicated by dotted lines in Fig. 4A and 4B. If response curve appears as in Fig. 4A, adjust A28 and A29 until curve appears as in Fig. 4B. This adjustment over compensates to allow for channel 13 adjustment. Repeat steps 14 and 15 until centered and symmetrical response curves are obtained on channels 7 and 13.
16.	"	"	85MC (10MC Swp)	85MC	6	"	A30, A31, A32	Adjust for symmetrical response approximately at center of bandpass. Adjust A30 counter clockwise until single peak on 85MC marker. Adjust A32 for maximum amplitude and symmetry of single peak. Retouch SLIGHTLY if necessary, A30 and A31 for symmetrical response centered about the 85MC marker.

UHF ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

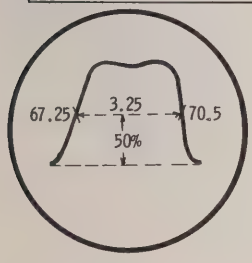


FIG. 1

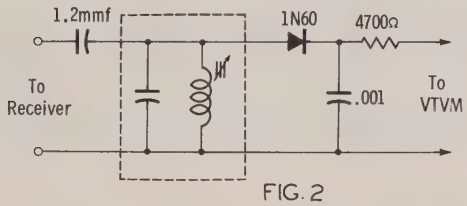


FIG. 2

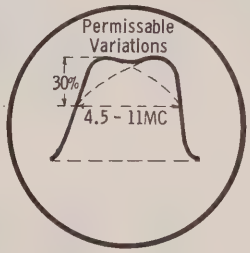


FIG. 3

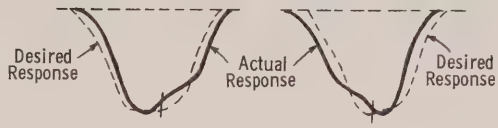
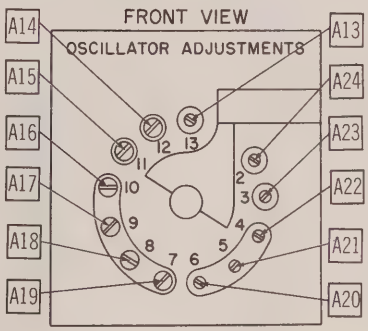
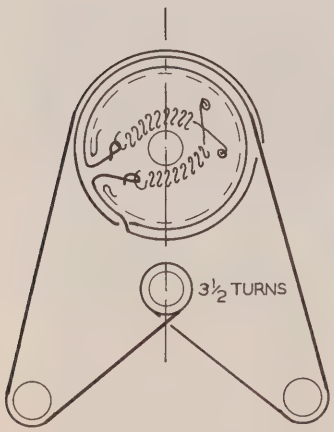


FIG. 4A FIG. 4B



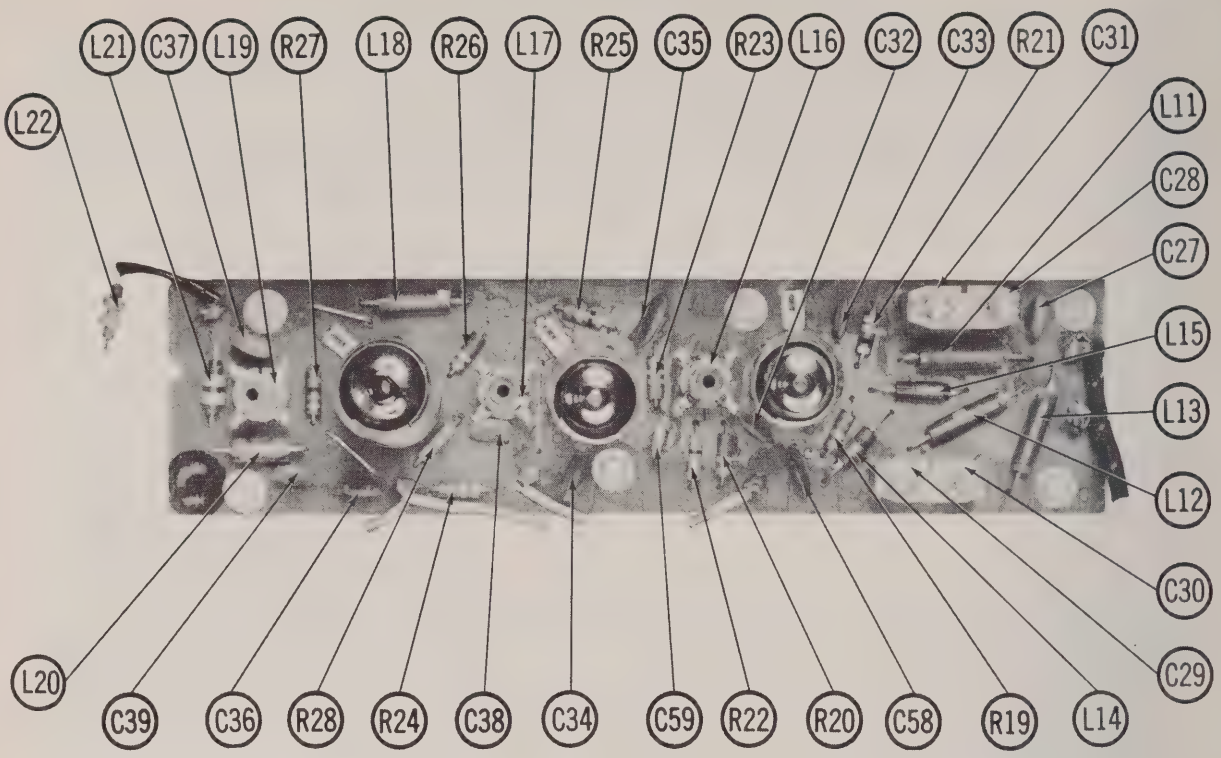


UHF DRIVE CORD STRINGING

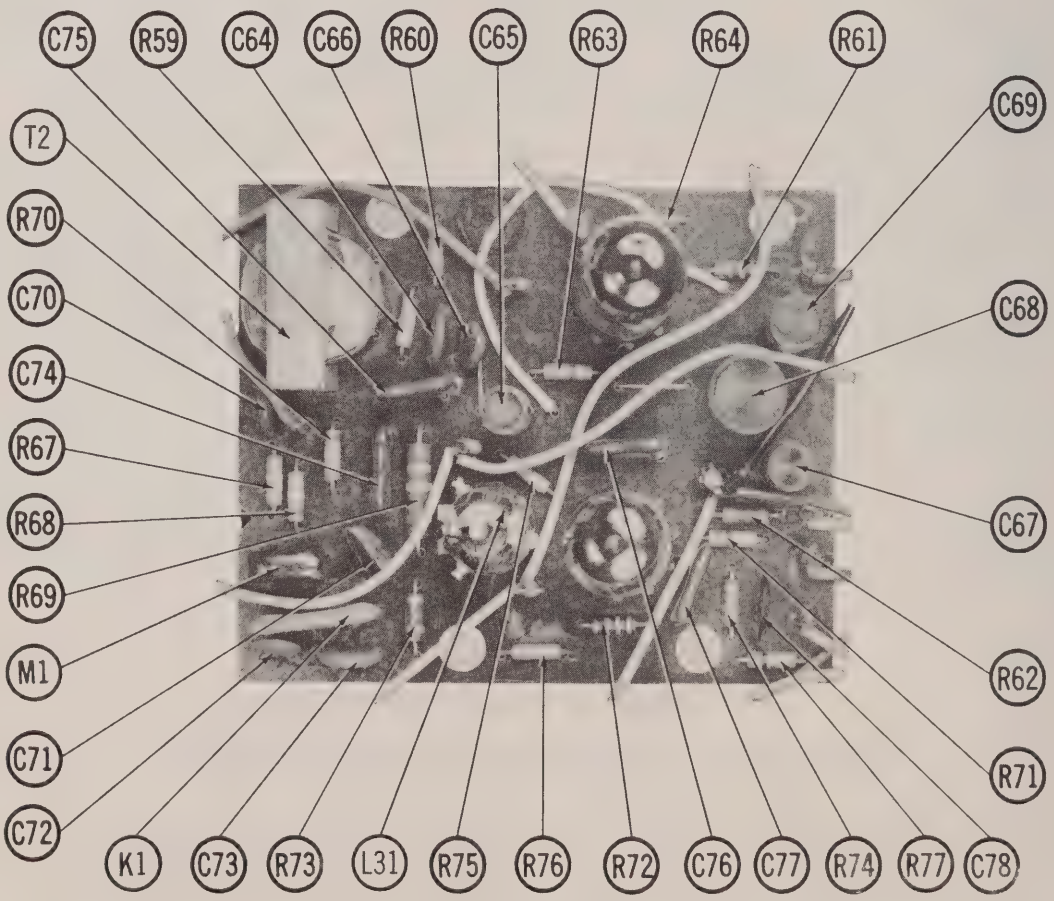
HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

1. Turn the contrast control counter clockwise until the blanking is visible.
2. Set the horizontal hold control at the center of its range.
3. Short out the horizontal frequency coil (L31) by clipping a .1MFD capacitor from point Ⓖ to chassis.
4. Adjust horizontal hold aux. control (R5B)until equal blanking appears on either side of the raster. This can be done by decentering the picture first to one side, then the other, by moving the centering device.
5. Remove the shorting capacitor.
6. Adjust the horizontal frequency slug (B1) until the picture is brought into sync with equal blanking on either side of the raster.
7. Check the pull-in by turning the horizontal hold control until the picture goes out of sync and then slowly bring the picture back into sync. This pull-in should occur between 2½ and 3 bars. If pull-in is not correct, repeat the above steps.

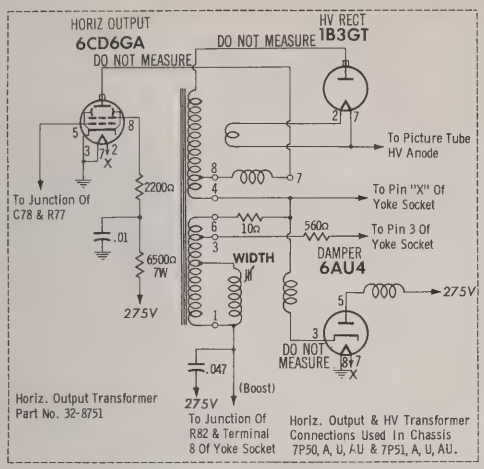
If the set has insufficient width complete the circuit of the width link located on the high voltage chassis.

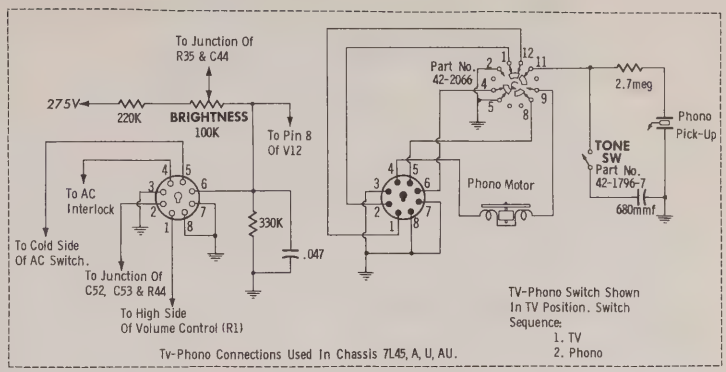


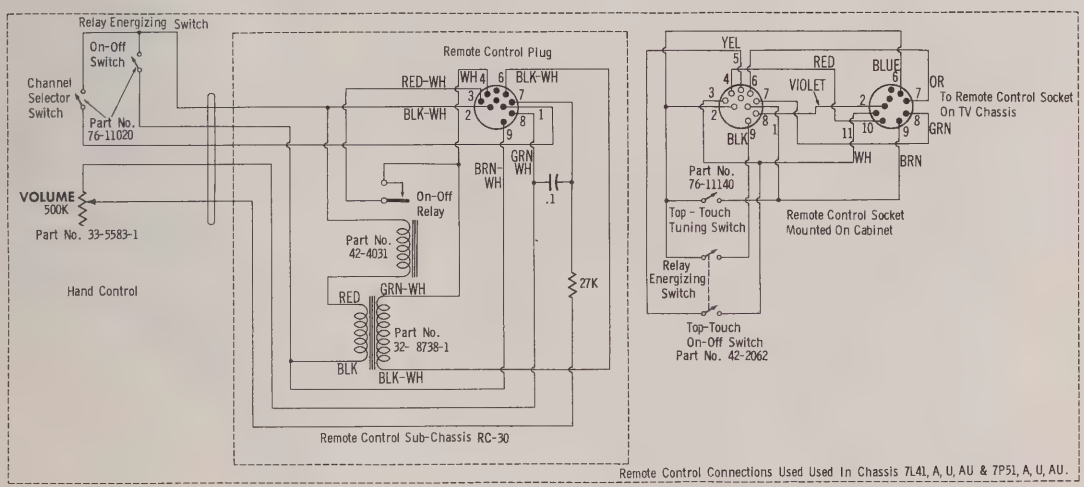
VIDEO IF PRINTED BOARD

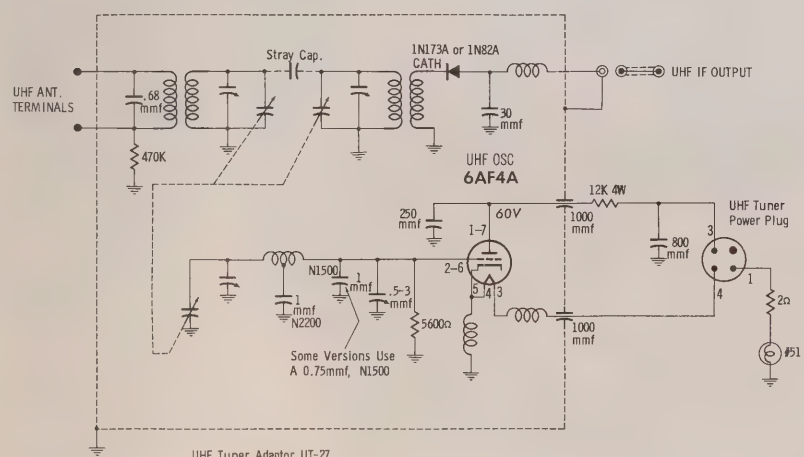


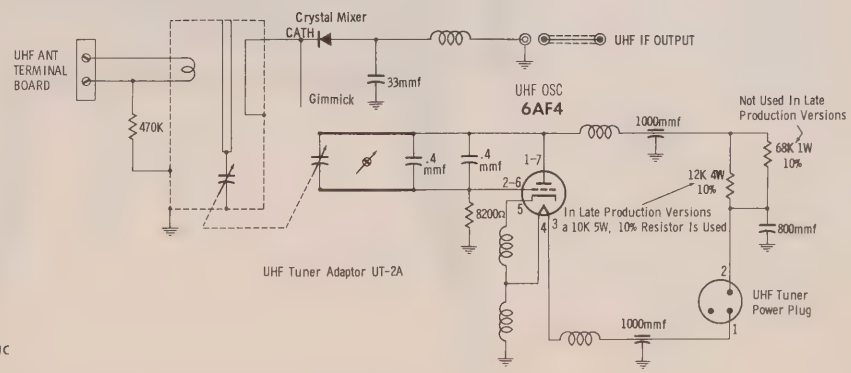
SWEEP PRINTED BOARD











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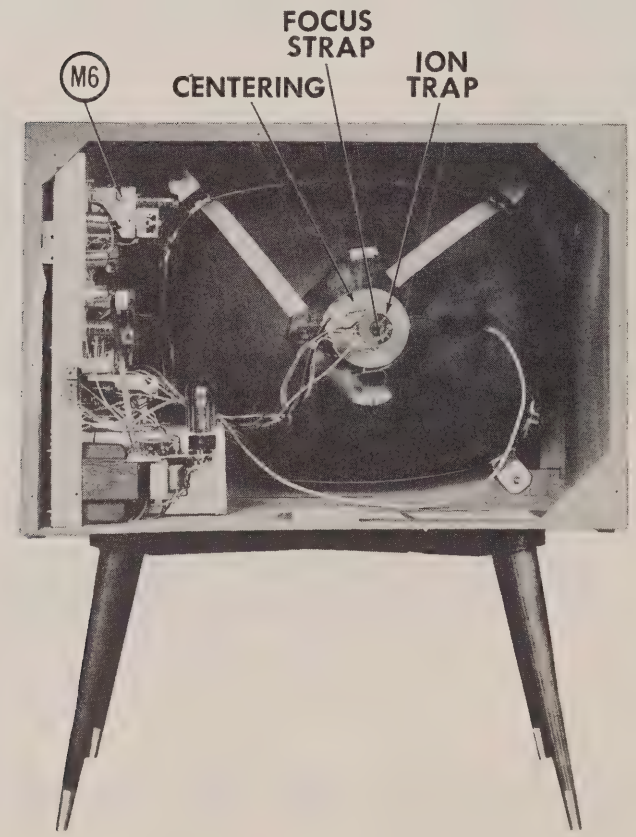
ALTERNATE CIRCUITS SCHEMATIC

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BQ7A	†1800Ω	240K	INF	0Ω	.1Ω	INF	2.3Meg	0Ω	0Ω
V2	6X8	0Ω	22K	■18K	0Ω	.1Ω	0Ω	100K	■ 9000Ω	†1000Ω
V3	6DE6	440K	47Ω	0Ω	.1Ω	■ 660Ω	■ 660Ω	0Ω		
V4	6DE6	440K	68Ω	0Ω	.1Ω	■ 330Ω	■ 330Ω	0Ω		
V5	6AM8	220Ω	.1Ω	†1000Ω	.1Ω	0Ω	†1000Ω	.1Ω	3900Ω	0Ω
V6	6AW8	0Ω	2Meg	†50K	0Ω	.1Ω	82Ω	470K	■ 0Ω	†4800Ω
V7	6BY8	5.2Ω	0Ω	■150K	.1Ω	0Ω	■ 27K	■ 27K	■ 27K	330Ω
V8	6AV6	10Meg	0Ω	.1Ω	0Ω	2Meg	2Meg	†270K		
V9	6CU5	¶	550K	.1Ω	0Ω	550K	†41Ω	†210Ω		
V10	6CS7	ǂ7900Ω	TP	1.2Meg	0Ω	.1Ω	•ǂ 2.2Meg	• 410K	140Ω	•1200Ω
V11	12AU7A	†18K	6Meg	1200Ω	0Ω	0Ω	†48K	•100K	1200Ω	.1Ω
V12	6DQ6	TP	.1Ω	NC	†6900Ω	1Meg	TP	0Ω	0Ω	TOP CAP ǂ44Ω
V13	6AX4	NC	NC	¶	NC	†43Ω	NC	0Ω	.1Ω	
V14	1B3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP ǂ 414Ω
V15	5U4GB	NC	¶	NC	27Ω	NC	28Ω	NC	¶	
V16	21BTP4	0Ω	1Meg	PIN 6 ǂ7000Ω	PIN 10 ǂ7000Ω	PIN 11 • 170K	PIN12 .1Ω			

NC NO CONNECTION
TP TIE POINT
† MEASURED FROM PIN 8 OF V15.
■ MEASURED FROM 145V SOURCE.
• THIS READING WILL VARY, CONTROL SET FOR NORMAL OPERATION.
ǂ MEASURED FROM PIN 3 OF V13.
¶ THIS READING CAN VARY GREATLY, (10K MINIMUM), DUE TO THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.



CABINET—REAR VIEW

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DENVER, COLORADO

CHASSIS TOP VIEW

PHILCO CHASSIS 7L40, A, AU, U, 7L41, A, AU, U, 7L45AU, U, 7P50, A, AU, U, 7P51, A, AU, U

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V1	RF Amplifier	6BQ7A	
V2	Mixer-Oscillator	6X4	
V3	1st Video IF Amp	6DK6	
V4	2nd Video IF Amp	6DK6	
V5	3rd Video IF Amp. - Limiter	6AM8	
V6	Video Det.	6AM8	
V7	Video Output-Sync Sep	6AW8	
V8	Sound IF Amp - Limiter	6BY8	

ITEM No	USE	TYPE	NOTES
V8	AF Amp.-AGC Clamper	6AV6	
V9	Audio Output	6CL5	
V10	Vert. Osc.-Vert. Output	6SC7	
V11	Horiz. Mult.	12AU7A	
V12	Horiz. Output	6DQ6	
V13	Damper	6AX4	
V14	HV Rectifier	1B3GT	
V15	LV Rectifier	5U4GB	

PICTURE TUBE

ITEM No	REPLACEMENT DATA				NOTES
	PHILCO PART No	CBS PART No	GENERAL ELECTRIC PART No	SYLVANIA PART No	
V16	21BTP4 21ZP4B	21ZP4B ①	21ZP4B ①	21BTP4 ① 21ZP4B ①	① Silver screen 85 % Aluminized
				21ZP4A	
				21ZP4	
	24ABP4			24ABP4	
				24CP4A	
				24CP4	

ELECTROLYTIC CAPACITORS

ITEM No	RATING		REPLACEMENT DATA						NOTES
	CAP	VOLT	PHILCO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	40	450	30-2880-14	AFH4-47-450	C1336	TP385	TMT-43	ET-735	TE2355 *
B	480	350	(Note 1)		BR6045	VC90	TD-100-3206	MT-4580	
C	150	200							
D	100	350							
C2A	100	50	30-2890-7	AFH3-157	C1180	TP175	TMS-86	ES-296	TVL-3928
B	30	475				TC350L	TD-100-50	MTH-5010	

Note 1 Some versions C1B and C1C are 400V sections (Ci part #30-2590-6)
* Non-catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No	RATING		REPLACEMENT DATA						NOTES
	CAP	VOLT	PHILCO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.
C3	39		62-03940901	NPO-SI 39	TCZ-39	C1QG3SC	TCO-39	ST-555	5TCC-Q39
C4	5		30-1324-78	NPO-SI 5	TCZ-4R7	C1QV5C	TCO-5	ST-555	5TCCB-V4
C5	5		30-1324-78	NPO-SI 5	TCZ-4R7	C1QV5C	TCO-5	ST-555	5TCCB-V4
C6	3.3		30-1321-9	NPO-SI 3.3		C1QV3ZC	TCO-3.3	ST-5553	5TCCB-V3
C7	4.7		30-1324-78	NPO-SI 5	TCZ-4R7	C1QV5C	TCO-5	ST-555	5TCCB-V4
C8	1000		30-1345-6	EF-001	MFT-1000				50S-CD
C9	150		30-1238-9	BPD-00015	DD-151	L10T15	ED-150	UC-5315	5GA-T15
C10	5-3		31-5520-3		529-3		3115-D	C7565A	532-D
C11	1000		30-1345-6	EF-001	MFT-1000				50S-CD
C12	150		30-1238-9	BPD-00015	DD-151	L10T15	ED-150	UC-5315	5GA-T15
C13	1-2		30-1224-71	NPO-SI 1	TCZ-1		TCO-1		5TCCB-V1
C14	3.3		30-1321-9	NPO-SI 3.3	TCZ-3R3	C1QV3ZC	TCO-3.3		5TCCB-V3
C15	1000		30-1345-6	EF-001	MFT-1000				50S-CD
C16	10000		30-1353-1	BPD-01	DD-103	BYA8SI	ED-01	DC5U	5HK-EI
C17	1000		30-1345-6	EF-001	MFT-1000				50S-CD
C18	10		30-1324-81	NPO-SI 10	TCZ-10	C1QG2C	TCO-10	ST-551	5TCC-Q1
C19	12		30-1325						5TCC-Q1
C20	1-8		30-1224-130		TCN-1R5	C1QV1SU	TCT-1.5		
C21	56		62-05540901	NPO-SI 56	TCZ-56	C1QG5C	TCO-56		5TCC-Q56
C22	5-3		31-5520-3		529-3		3115-D	C7565A	
C23	7-9		30-1251-10						
C24	680		62-16800111	BPD-00068	DD-681	BYA10T68	ED-680	UC-5368	5GA-T68
C25	1000		30-1345-6	EF-001	MFT-1000				50S-CD
C26	150		30-1238-9	BPD-00015	DD-151	L10T15	ED-150	UC-5315	5GA-T15
C27	3-3		30-1263-3		TCN-3R3	C1QV3SU	TCT-3.3		5TCCB-V33
C28	5-3		31-5520-19		529-5		532-B		N750
C29	1-5		31-5520-19		529-5		532-B		
C30	5-3		31-5520-3		529-3		3115-D	C7565A	
C31	1-5		31-5520-19		529-5		532-B		
C32	680		30-1262-15	BPD-00068	DD-681	BYA10T68	ED-680	UC-5368	5GA-T68
C33	470		30-1252-18	BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	5GA-T47
C34	680		30-1262-15	BPD-00068	DD-681	BYA10T68	ED-680	UC-5368	5GA-T68
C35	18		30-1263-2	BPD-00018	DD-180	L00Q8	ED-18	UC-5318	5GA-Q18
C36	1500		30-1262-9	BPD-0015	DD-152	BYA10J15	ED-0015	DC5215	5HK-DX5
C37	680		30-1262-15	BPD-00068	DD-681	BYA10T68	ED-680	UC-5368	5GA-T68
C38	1500		30-1252-8	BPD-00152	DD-152	BYA10J15	ED-0015	DC5215	5HK-DX5
C39	5		30-1263	BPD-000005	DE-050	L10Y5	ED-5	ZT-555	5GA-Y5
C40	047	200	30-4650-45	BPD-05	DF-503	CUB4Z47		GEM-4247	4TM-Z47
C41	0047	200	30-4650-58	BPD-0047	DF-472	CUB3Z47	GP-4700	GEM-3247	3TM-D47
C42	68		62-05680201	01 68	DE-680	L7SQ68	GP-68	GEM-4268	4TM-Q68
C43	1	600	30-4650-47	P488N-1		DF-104		GEM-401	4TM-P1
C44	220			01 220		DE-220	L1ST22	GP-220	UC-5322	5GA-T22
C45	047	400	30-4650-48	BPD-05		DF-503	CUB4S47		GEM-4247	4TM-S47
C46	024	400	30-4650-43	BPD-03		DF-303	CUB4S22	ED-03	GEM-4122	4TM-S22
C47	022	600	30-1252-5	BPD-0022		DD-223	BYA10Z22	ED-0022	UC-5322	5GA-Z22
C48	4700		30-1252-3	BPD-0047		DD-472	BYA10D47	ED-0047	UC-5347	5GA-D47
C49	470		30-1252-18	BPD-00047		DD-471	BYA10T47	ED-470	UC-5347	5GA-T47
C50	47	300	30-4650-34				BC2F47		SME-247	2TM-F47
C51	2.2			NPO-SI 3.3	TCZ-3R3	C1QV3SC	TCO-3.3	ZT-5533	5TCCB-V33
C52	1500		30-1262-4	BPD-0033	DD-332	BYA10D33	ED-0033	UC-5233	5GA-D33
C53	680		62-16800101	01 680	DE-681	L7ST68	ED-680	UC-5368	5GA-T68
C54	4700		30-1252-3	BPD-0047	DD-472	BYA10D47	ED-0047	UC-5347	5GA-D47
C55	8000		30-1262-1						
C56	10000		30-1224-3	BPD-01	DD-103	BYA8SI	ED-01	DC5U	5HK-EI
C57	047	200	30-4650-47	P488N-1		DF-104	CUB3Z4		GEM-301	3TM-P1
C58	1500		30-1262-8	BPD-0015	DD-152	BYA10D15	ED-0015	DC5215	5HK-DX5
C59	1500		30-1252-8	BPD-0015	DD-152	BYA10J15	ED-0015	DC5215	5HK-DX5
C60	470		30-1262-17	BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	5GA-T47
C61	470		30-1252-3	BPD-0047		DD-472	BYA10D47	ED-0047	UC-5347	5GA-D47
C62	150		30-1262-24	BPD-00015		DD-151	L10T15	ED-150	UC-5315	5GA-T15
C63	4700									
C64	4200		30-1263-7	BPD-0042		DE-223	BYA10D22	ED-0022	UC-5322	5GA-D22
C65	022	400	30-4684-43				BC8S2J	ED-02	ACE-S12	4SE-S22
C66	330		30-1262-21	BPD-00033		DD-331	L10T33	ED-330	UC-5333	5GA-T33
C67	015	400	30-4684-42				BC8S1J	ED-01	ACE-S11	4SE-S15
C68	1	400	30-4684-47				BC8P1J		ACE-S01	4SE-P10
C69	033	600	30-4688-3				BC8S3J			4SE-S33
C70	68		30-1263-6	BPD-00068		DD-680	L00Q68	ED-68	UC-5468	5GA-Q68
C71	120		30-1263-8	BPD-00013		DD-131	L10T13	ED-130	UC-5313	5GA-T13
C72	1000		30-1262-12	BPD-001		DD-102	BYA8SI	ED-1000	DC5U	5HK-DI
C73	1500		30-1262-10	BPD-0015		DD-152	BYA10D15	ED-0015	DC5215	5HK-DX5

CAPACITORS (cont)

ITEM No	RATING		REPLACEMENT DATA						NOTES
	CAP	VOLT	PHILCO PART No	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No	SPRAGUE PART No.	
C74	2200		30-1264-2	BPD-0022	DE-222	BYA10DE2	ED-0022	UC-5222	5GA-222	
C75	470		30-1264	14649-0004	DE-320	L7SQ92	ED-52		5GA-T47	
C76	390		30-1264-1	1468-00039	DD-391	L7ST39	ED-390	UC-5339	MS-339	
C77	390			1468-00039	DD-391	L7ST39	ED-390	UC-5339	MS-339	
C78	4700		30-1263-3	BPD-0047	DD-472	BYA10D47	ED-0047	UC-5347	5HK-D47	
C79	047	400	30-4650-48	BPD-05		DF-503	CUB4S47		GEM-4247	4TM-S47
C80	047	400	30-4650-52	BPD-05		DF-503	CUB4S47		GEM-4247	4TM-S47
C81	68	4000	30-1246-1			HVD-50-68				
C82	22	600	30-4690-49			P289N-22		CUB3P22	GEM-2022	2TM-P22

Note 1. Some versions use a 10000MMF in this application (Part #30-1338-2).

CONTROLS

ITEM No	RATING		REPLACEMENT DATA						NOTES
	RESISTANCE	WATTS	PHILCO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES	
R1A	250K		33-5566-77	B-51	A47-250K-Z	Q13-130	U44	Volume	
B	Shaft			Not Req.	FS-2	Not Req.	Not Req.		
C	Switch			KB-1	SWE-12	76-1	U3-35		
R2	15K		33-5535-41			*		Contrast - tap @ 5000Ω	
R3A	100K		33-5573-23			†	UC-1127	Brightness	
B	60000							Vert Linearity	
R4A	300K		33-5573-33			‡	UE-1677	Vert Hold	
B	2Meg						Not Req.	Height	
A	1Meg		33-5573-33			§		Vert. Hold - Note 1	
B	2Meg							Height	
R5A	30K		33-5573-34	T1-28			UE-852	Horiz. Hold	
B	60K			B3-34			Not Req.	Horiz. Hold Asm.	

* Concentrikit Equivalent, K-6 K1t, Base Element & Shaft, R13-115K, P13-128 (Panel)
† Concentrikit Equivalent, K-6 K1t, Base Elements & Shafts, R11-12K, P13-128 (Panel)
R11-15, R15-005 (Rear)
‡ Concentrikit Equivalent, K-5 K1t, Base Elements & Shafts, R11-12, P13-128 (Panel)
R11-25, R15-005 (Rear)
* Concentrikit Equivalent, K-6 K1t, Base Elements & Shafts, R11-13T, P13-128 (Panel)
R11-129, R15-005 (Rear)
§ Concentrikit Equivalent, K-6 K1t, Base Elements & Shafts, R11-11L, P13-128 (Panel)
R11-130, R15-005 (Rear)

Note 1. Alternate part number used in some versions.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	PHILCO PART No.	IRC PART No.	
R6	150K		66-4158240	BTS-150K	
R7	10K		66-5108340	BTS-10K	
R8	470K 5%		66-4478240	BTS-470K 5%	
R9	470K 5%		66-4478240	BTS-470K 5%	
R10	1800Ω	1	66-1184340	BTA-1800	
R11	100K		66-4108340	BTS-100K	
R12	13K		66-3138340	BTS-13K	
R13	8200Ω		66-3828340	BTS-8200	
R14	18K		66-3188340	BTS-18K	
R15	1000Ω		66-2108340	BTS-1000	
R16	33K		66-3338340	BTS-33K	
R17	150K		66-3108340	BTS-150K	
R18	3000Ω		66-3128340	BTS-3500	
R19	22K		66-3228340		
R20	330Ω		66-1338340	BTS-330	
R21	47Ω		66-0478340	BTS-47	
R22	1000Ω		66-2108340	BTS-1000	
R23	27K		66-3278340	BTS-27K	
R24	330Ω		66-1338340	BTS-330	
R25	680		66-0688340	BTS-680	
R26	15K		66-3158340	BTS-15K	
R27	1000Ω		66-2108340	BTS-1000	
R28	220Ω		66-1228340	BTS-220	
R29	470K		66-4478340	BTS-470K	
R30	3900Ω		66-2398340	BTS-3900	
R31	4.7Meg		66-5478340	BTS-4.7Meg	
R32	470K		66-4478340	BTS-470K	
R33	1300Ω	1	66-2134340		
R34	3900Ω		66-2398340	BTS-3900	
R35	150K		66-4158340	BTS-150K	
R36	220K		66-4228340	BTS-220K	
R37	10K		66-3108340	BTS-10K	
R38	82Ω		66-0828340	BTS-82	
R39	220K		66-4228340	BTS-220K	
R40	130K		66-4138340	BTS-130K	
R41	27K		66-3278340	BTS-27K	
R42	56K		66-3568340	BTS-56K	Note 1
R43	33K		66-3338340	BTS-33K	Note 1
R44	10K		66-3108340	BTS-10K	
R45	10Meg		66-5108340	BTS-10Meg	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	PHILCO PART No.	IRC PART No.	
R46	270K		66-4278340	BTS-270K	
R47	1Meg		66-5108340	BTS-1Meg	
R48	1.5Meg		66-5158340	BTS-1.5Meg	
R49	220Ω	1	66-1228340	BTA-220	
R50	820K		66-4828340	BTS-820K	Note 2
R51	2.2Meg		66-5228340	BTS-2.2Meg	
R52	10Meg 5%		66-6108340	BTS-10Meg 5%	
R53	220K		66-4228340	BTS-220K	
R54	10Meg		66-5108340	BTS-10Meg	Note 3
R55	10K		66-3108340	BTS-10K	
R56	5.6Meg		66-5568340	BTS-5.6Meg	
R57	150K		66-4158340	BTS-150K	
R58	5600Ω	7	66-2568340		
R59	33K		66-3338340	BTS-33K	
R60	33K		66-3338340	BTS-33K	
R61	270K		66-4278340	BTS-270K	
R62	1.5Meg		66-5158340	BTS-1.5Meg	
R63	1.5Meg 5%		66-5158340	BTS-1.5Meg	
R64	18K		66-3188340	BTS-18K	
R65	1000Ω		66-2108340		
R66	1000Ω		66-2108340		
R67	330Ω		66-1338340		
R68	680K		66-6838340		
R69	15K	1	66-3158340		
R70	68K		66-3688340		
R71	56K		66-3568340		
R72	39K		66-3398340		
R73	8200Ω		66-2828340		
R74	6800Ω		66-2688340		
R75	3300Ω		66-2338340		
R76	1800Ω		66-2188340		
R77	10K		66-3108340	BTS-1Meg	
R78	220Ω	1	66-1228340	BTA-2200	Note 4
R79	470Ω	2		BTA-4700	Note 5
R80	2200Ω	2	66-2858340	BTB-8200	
R81	39K	3	66-3398340	BTS-39K	
R82	7000Ω	7	33-1355-126		Note 6
R83	560Ω		66-1568340	BTS-560	
R84	1Meg		66-5108340	BTS-1Meg	
R86	470K		66-4478340	BTS-470K	

Note 1. A 27K may be used in some versions (Part #66-3278340).
Note 2. A 1Meg may be used in some versions (Part #66-5108340).
Note 3. A 5.6Meg may be used in some versions.
Note 4. Not used in some versions
Note 5. A 8500Ω, 7W (Part #33-1335-149 or a 7000Ω, 7W (Part #33-1335-136) may be used in some versions.
Note 6 A 6200Ω, 7W may be used in some versions.

TRANSFORMER (POWER)

ITEM No	RATING				REPLACEMENT DATA					NOTES
	PRI	SEC. 1	SEC. 2	SEC. 3	PHILCO PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No	Thordarson PART No	Triad PART No
T1	117VAC	540VCT	5V	12.6VCT	32-8755 ①			P-8352 ②	26R68 ③	
	50-60	@ 220A	@ 3A	@ 4.6A						

① Used in Ch. TL40, A, U, AU, TL41, A, U, AU, TL45U, AU. Alternate Part #32-8761 used in Ch. TP50, A, U, AU, TP51, A, U, AU
② Drill new mounting holes.
③ Use Universal mounting brackets. Connect 6.3V @ 6A fil. windings in series and phase for 12.6VCT fil. winding. Tape 6.3V @ 1.2A fil. winding.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No	USE	REPLACEMENT DATA								NOTES
		PHILCO PART No	Halldorson PART No.	Merit PART No	RCA TYPE No	Ram PART No	Stancor PART No	Thordarson PART No	Triad PART No	
T2	Vert. Osc.	32-8750		A-3001 ①				A-8124 ①	26A01 ①	A-49X ①
T3	Horiz. Output	32-8753-1 ③		HVC-62.5 ②		X093 5 *8				
	Alt Horiz. Output	32-8751 ④						A-8123	26S54	A-102X
T4	Vert. Output	32-8858-1	21A04	A-3037	22ZT1	V313	A-8123	A-8123	26S54	A-102X
	Alt. Vert. Output	32-8858-1	21A04	A-3037	22ZT1	V313	A-8123	A-8123	26S54	A-102X
T5	Yoke-Horiz (22MH) (90°) Vert. (44.5MH)	76-9173-14	DF607	MDF-92 6 7	2S51E 8 7	6 7	DY-18A 6 7	DY-18A 6 7	Y-16 6 7	Y-41 WW18, YCI, CLI 7
T6	Rear Cover & Centering Device	76-11069 ⑤								

① Mount on back side of control panel.
② Connect yellow lead to junction of capacitors C85 and C86, connect green lead and black lead to vert. oscillator tube cathode, connect brown lead to ground.
③ Used in Ch. TL40, A, U, AU, TL41, A, U, AU, TL45U, AU
④ Used in Ch. TP50, A, U, AU, TP51, A, U, AU
⑤ Drill new mounting holes.
⑥ Use original yoke damping network, rear cover and centering device.
⑦ Connect yoke terminal #1 to yoke plug pin #6, yoke terminals #3 and #7 to yoke plug pin #5, yoke terminal #2 to yoke plug pin #.
‡ This part may be superceded by Parts Manufacturer's introduction of special unit for this application

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
7	1	2		2			
4	3	1		1			
8	3	3		3			
3	7	4		4			
1	4	7		7			
Special Notes	‡	‡		‡			

‡ If insufficient width, install approximately 100MFD @ 6KV capacitor across horizontal yoke terminals #1 and #3 . Remove 1 turn from filament winding.
@ Jumper terminals #1 and #6.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	PHILCO PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T6	2500Ω	3-4Ω	32-8748	22105 ①	A-3025 ②	A-3876	22S45	S-1X	① Tape hum reducing tap. ② Drill one new mounting hole

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	PHILCO PART No.	GUAM PART No.	
SP1	4" x 6"	PM	3-4Ω	38-1633-1	46A1	① Alternate part number
	4" x 6"	PM	3-4Ω	38-1633-8 ①	49A1	
	6 x 9"	PM	3-4Ω	38-1631-3 ①	89A2	
	5 1/4	PM	3-4Ω	38-1630-9 ①	53A1	
				38-1631-12		
				38-1631-20		
				38-1657-1		
				38-1657-2		
				45-9771		

COILS (RF-IF)

ITEM No.	USE	PHILCO PART No.	NOTES
L1	Ant. Coil	32-4527	
L2	Ant. Coil	32-4527	
L3	IF Trap	32-4719	
L4	Ant. Coils	32B-0061	Includes complete wafer assy.
L5	RF Coils	32B-0083	Includes complete wafer assy.
L6	RF Choke	33-4623-95	

ITEM No.	USE	PHILCO PART No.	NOTES
L7	Mixer Grid Coils	32B-0082	Includes complete wafer assy.
L8	Mixer Screen Decoupling	32-4653-32	
L9	RF Choke Coil	33-4624-4	Includes complete wafer switch assy.
L10	Mixer Plate Coil	32-4629-4	

ITEM No.	USE	REPLACEMENT DATA			NOTES
		PHILCO PART No.	MEISSNER PART No.	MILLER PART No.	
L11	47.25MC Trap	32-4645-3	19-1003	4606	2.44 Microhenries
L12	41.25MC Trap	32-4645-1			3 Microhenries
L13	47.25MC Trap	32-4645-3			2.44 Microhenries
L14	RF Coil	32-4645-3			.95 Microhenries
L15	1st. Video IF	32-4645-5			.25 Microhenry
L16	2nd. Video IF	32-4644-5			
L17	3rd. Video IF	32-4644-6			
L18	Fil. Choke	32-4645-6	19-1003	4606	2.8 Microhenries
L19	4th. Video IF	32-4644-7			
L20	Resonate Choke	32-4645-7			3 Microhenries - Channel 8
L21	RF Choke	32-4674	19-5022	6152	22 Microhenries
L22	RF Choke	32-4674	19-5022	6152	22 Microhenries
L23	Shunt Peaking Coil	32-4690-14	19-3680	6148	680 Microhenries
L24A	4.5MC Trap	32-4598-3			
B	1st. Video IF				
L25	Shunt Peaking Coil	32-4690-11	19-4400	TV-190	190 Microhenries
L26	RF Choke	32-4674	19-5022	6152	22 Microhenries - Note 1
L27	Series Peaking Coil	32-4690-8	19-3280	TV-185	270 Microhenries
L28	RF Choke	32-4112-50	19-1005	4622	11 Microhenries
L29	RF Choke				Wound on 2W resistor in series
L30	RF Choke	32-4112-43	19-1007	6175	.8i Microhenry

Note 1. Not used in some versions.
* Part of HV transformer

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES.		REPLACEMENT DATA							NOTES
	PRI.	SEC.	PHILCO PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	RCA TYPE No.	Ram PART No.	Thordarson PART No.	
L31	175Ω		32-4672-3							

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∿)	PHILCO PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L32	.220A	41Ω	1.3 HY.	32-8710-2 ①	C5037 ②	C-2996 ③	C-2326 ③	26C44	C-23X

① Alternate part #32-8710.
② Drill one new mounting hole.
③ Drill two new mounting holes.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	PHILCO PART No.	REPLACEMENT DATA
K1	Horiz. Sync	1000MMF, 14000MMF, 4.7Meg, 220K	30-6009-3	Aerovox PA366-4

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT (Measured)	PHILCO PART No.	FEDERAL PART No.	GENERAL ELECTRIC PART No.	INTERNATIONAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.	
M1		34-8037-1①②	1215 ② ③	1T1 ② ③				

① Alternate part #34-8037.
② Selenium type (Horiz. Phase Det.).
③ 2 Required.

FUSES

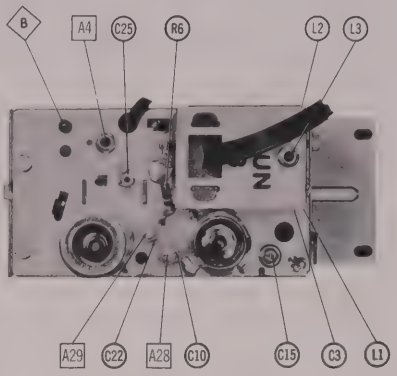
ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			PHILCO PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M3	N	.7A 250V	27-6318-1	27-6317-1	333.700 (N 7/10A)	346010	N 7/10 A	HN 1/2 to 3/4

CRYSTAL DIODES

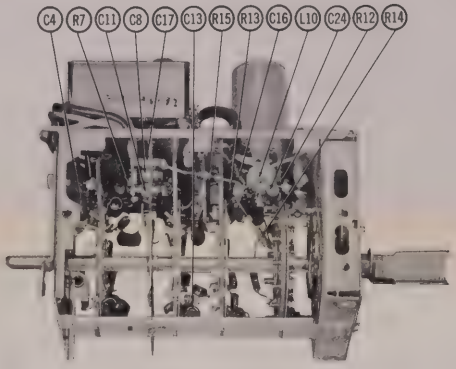
ITEM No.	ORIG. TYPE	REPLACEMENT DATA		NOTES
		PHILCO PART No.	SYLVANIA PART No.	
M3	1N60A	34-8022-2	1N60	Discriminator (Pigtail)
M4	1N60A	34-8022-2	1N60	Discriminator (Pigtail)

MISCELLANEOUS

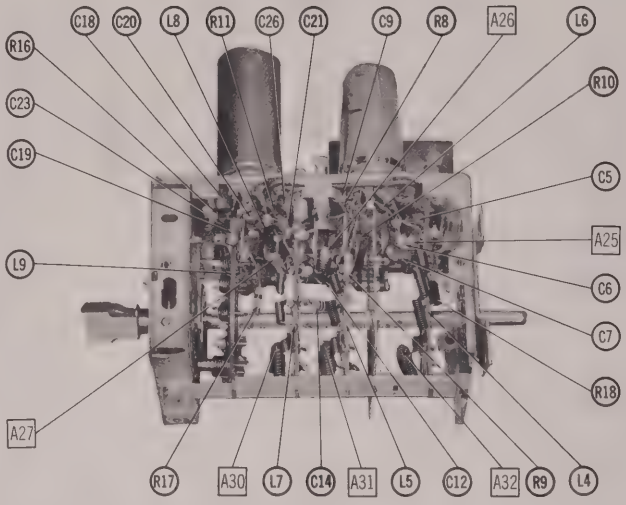
ITEM No.	PART NAME	PHILCO PART No.	NOTES
M5	Dial Light	34-2031-4	Type #1847
M6	Tuner	76-11190	T-63, VHF, Used in Ch. 7L40, A, 7L41, A, 7P50, A, 7P51, A
	Tuner	76-11106	T-64, UHF/VHF, Used in Ch. 7L40U, AU, 7L41U, AU, 7L45U, AU, 7P50U, AU, 7P51U, AU
M7	Discriminator	32-4691	Transformer - Used in Ch. 7L40, U, 7L41, U, 7L45U, 7P50, U, 7P51, U
	Discriminator	32-4689-1	Transformer - Used in Ch. 7L40 A, AU, 7L41A, AU, 7L45AU, 7P50A, AU, 7P51A, AU
M8	Centering Device	76-11069	Includes yoke rear cover - Used in Ch. 7L40, A, U, AU, 7L41, A, U, AU, 7L45U, AU
	Magnet	76-11134	Focus - Used in Ch. 7P50, A, U, AU, 7P51, A, U, AU
M9	Ion Trap	76-6077-2	
	Printed Board	54-9826	Video IF, less components
	Printed Board	54-9830	Video, less components
	Printed Board	54-9828	Sound, less components - Used in Ch. 7L40, U, 7L41, U, 7L45U, 7P50, U, 7P51, U
	Printed Board	54-9992	Sound, less components - Used in Ch. 7L40A, AU, 7L41A, AU, 7L45AU, 7P50A, AU, 7P51A, AU
	Printed Board	54-9829	Sweep, less components
	Safety Glass	54-9213-52	Used in E4000 or UE4000 Series
	Safety Glass	54-9213-66	Used in E6000 or UE6000 Series
	Knob	76-11142-4	Channel Selector - Used in Models E4204, E4206SL, E4206STM, E4027SC, E4602, E4602L, E4602TL, E4602TM, E4604, E4604HM, E4608, E4610N, E4612G, E4614S, E4614SL, E4700N, E6200, E6204M, L, E6602M, L, T, TL, E6604M, T,
	Knob	76-11142-2	Channel Selector - Used in Models UE4204, L, E4204L, UE4206SL, STM, UE4207SC, UE4602, L, TL, TM, UE4604, HM, UE4608, UE4610N, UE4612G, UE4614S, SL, UE4700N, UE4802M, L, UE4804L, UE6200, UE6204M, L, UE6602M, L, T, TL, UE6604M, L, T
	Knob	76-11142-5	Channel Selector - Used in Model E4600
	Knob	76-11142-6	Channel Selector - Used in Model EU4600
	Knob	76-11142-1	Channel Selector - Used in Model E6604L
	Knob	28-11353-1	Channel Selector - Used in Models E6606, UE6606
	Knob	54-6307-1	Fine Tuning - Used in All models except E6606, UE6606
	Knob	54-6297-3	Fine tuning - Used in Models E6606, UE6606
	Knob	54-6300-2	Control, 4 used, - Used in Models E4204, L, UE4204, L, E4600, UE4600, E4612G, UE4612G, E6200, UE6200, E6204M, UE6204M
	Knob	54-6300-1	Control, 4 used, - Used in models EA4206SL, STM, UE4206SL, STM, E4604,HM,UE4604, HM, E4608, UE4608, E4610, UE4610, E4614SL, UE4614SL, E4700N, UE4700, UE4802M, E6602M, L, T,TL,U E6602L, M, T, TL, E6604L, UE6604L
	Knob	54-6300-5	Control, 4 used, - Used in Models E4207SC, UE4207SC, E4602, L, TL, TM, UE4602, L, TL, TM, E6604M, UE6604M, E6604T, UE6604T, E6606, UE6606
	Knob	54-6300-4	Control, 4 used, - Used in Models UE4802L, E6204L, UE6204L, UE4804L
	Knob	54-6299-2	On-off volume, Used in all Models except E4602TL, UE4602TL, E6602T, TL, UE6602T, TL, UE6602T, TL, E6604T, UE6604T
	Knob	54-6299-4	On-off volume, Used in Models E4602TL, UE4602TL, E6602T, TL, UE6602T, TL, E6604T, UE6604T



RF TUNER-TOP VIEW



RF TUNER-LEFT SIDE



RF TUNER-RIGHT SIDE

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

SENTINEL
CHASSIS AMP-151AA, BB

SENTINEL
CHASSIS AMP-151AA, BB

TRADE NAME	Sentinel Chassis AMP-151AA, AMP-151BB
MANUFACTURER	Sentinel Radio Co., Fort Wayne 4, Indiana
TYPE SET	AC Operated 6 Watt Audio Amplifier
TUBES (Four)	Types 12AX7 AF Amp.-Phase Inv., (2) 6AQ5 Output, 6X5GT Rectifier
POWER SUPPLY	110-120 Volts AC - 50/60 Cycles RATING .37 Amp. @ 117 Volts AC

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PARTS LIST AND DESCRIPTIONS

SENTINEL
CHASSIS AMP-151AA

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	AF Amp. -Phase Inverter	12AX7	
V2	Output	6AQ5	
V3	Output	6AQ5	
V4	Rectifier	6X5GT	Note 1

Note 1. Type 5Y3GT used in "BB" versions

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	SENTINEL PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲40	300	270021-61	AFH4-01-80	D0440	FP419. 86	TMQ-56	Q-210	TVL-4621
B	■20	300							
C	▲10	300							
D	10	25							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	SENTINEL PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	.1	200	250202-13	P288N-1	DF-104	CUB2P1		PT401	2TM-P1	
C3	10000		250218-19	BPD-01	DD-103	K082	ED-01	DC511	5HK-S1	
C4	10000		250218-19	BPD-01	DD-103	K082	ED-01	DC511	5HK-S1	
C5	.047	200	250202-11	BPD-05	DF-503	CUB2S47		PT4147	2TM-S47	
C6	1.0	100	250172-9	P288N-1.0		CUB2W1		PT41	2TM-M1	
C7	10000	1000	250219-2	P1088N-01	DD-103	CUB16S1		PT1611	10HK-S1	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SENTINEL PART No.	IRC PART No.	
R1	470Ω		230104-58	BTS-470	
R2	10K		230104-74	BTS-10K	
R3	150K		230104-88	BTS-150K	
R4	470K		230104-94	BTS-470K	
R5	6800Ω		230104-72	BTS-6800	
R6	22K		230104-78	BTS-22K	
R7	470K		230104-94	BTS-470K	
R8	470K		230104-94	BTS-470K	
R9	470K		230104-94	BTS-470K	
R10	220Ω	2	230096-54	BTB-220	
R11	1500Ω		230104-64	BTS-1500	Note 1
R12	22K		230104-78	BTS-22K	

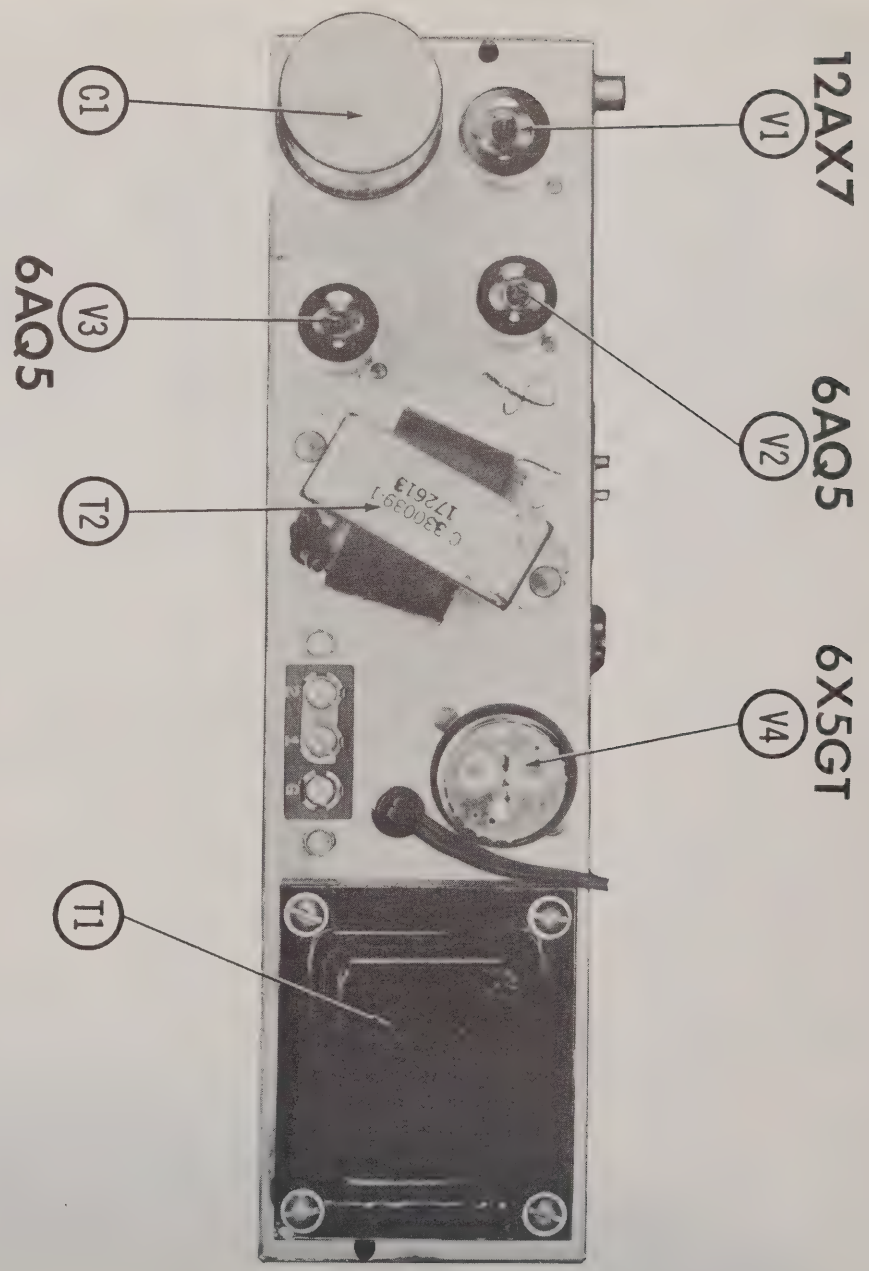
Note 1. 2 Watt resistor used in "BB" versions

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	SENTINEL PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC ② .37A	475VCT ② .064A	6.3Vac ② 1.8A		300088-1 ①	P9205 ③	P-3048	PM8419		R-8B ③
					300095-1 ②	P9205	P-3051	PM8403 ④		R-8B

① Used in "AA" versions
② Used in "BB" versions
③ Tape 5V, 2A winding
④ Tape center tap of 6.3V winding

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	SENTINEL PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thorderson PART No.	Triad PART No.	
T2	7200Ω	3-4Ω	330039-1	Z1009	A-2901	A-3852	24S61	S-53X	

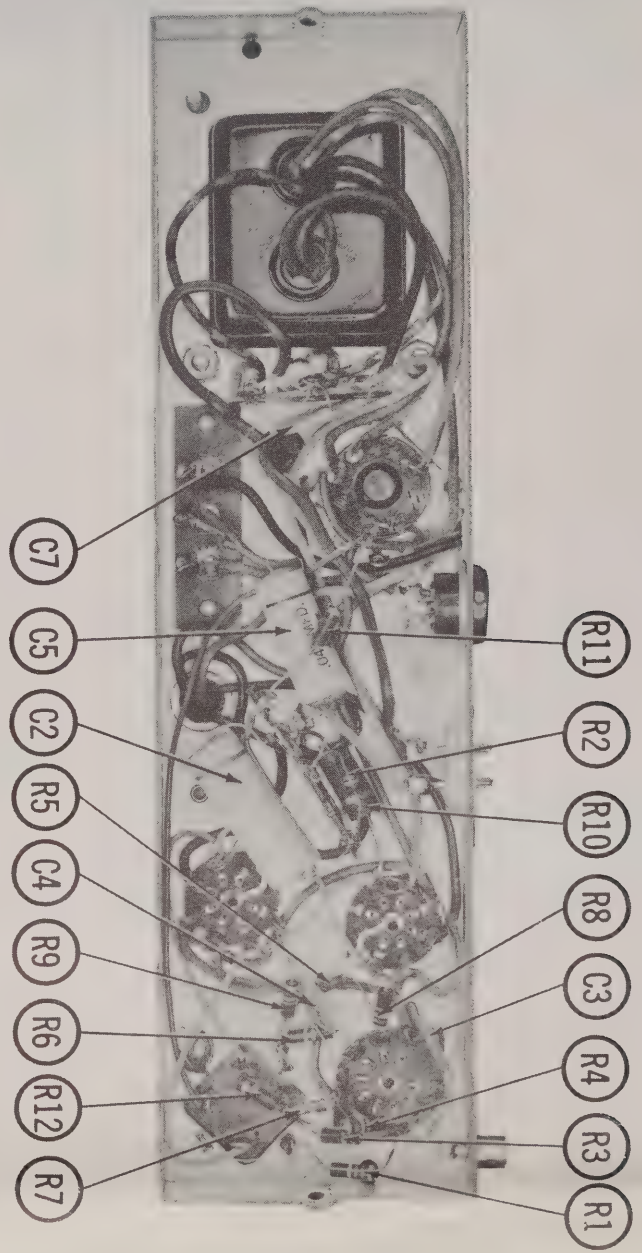
SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	SENTINEL PART No.	QUAM PART No.		
SP1			6Ω	583760-1			
SP2			6Ω	583760-1			
SP3	5"	PM	3.2Ω	580038-1	5A15TZ3.2		

MISCELLANEOUS

ITEM No.	PART NAME	SENTINEL PART No.	NOTES
M1	Pilot Light		

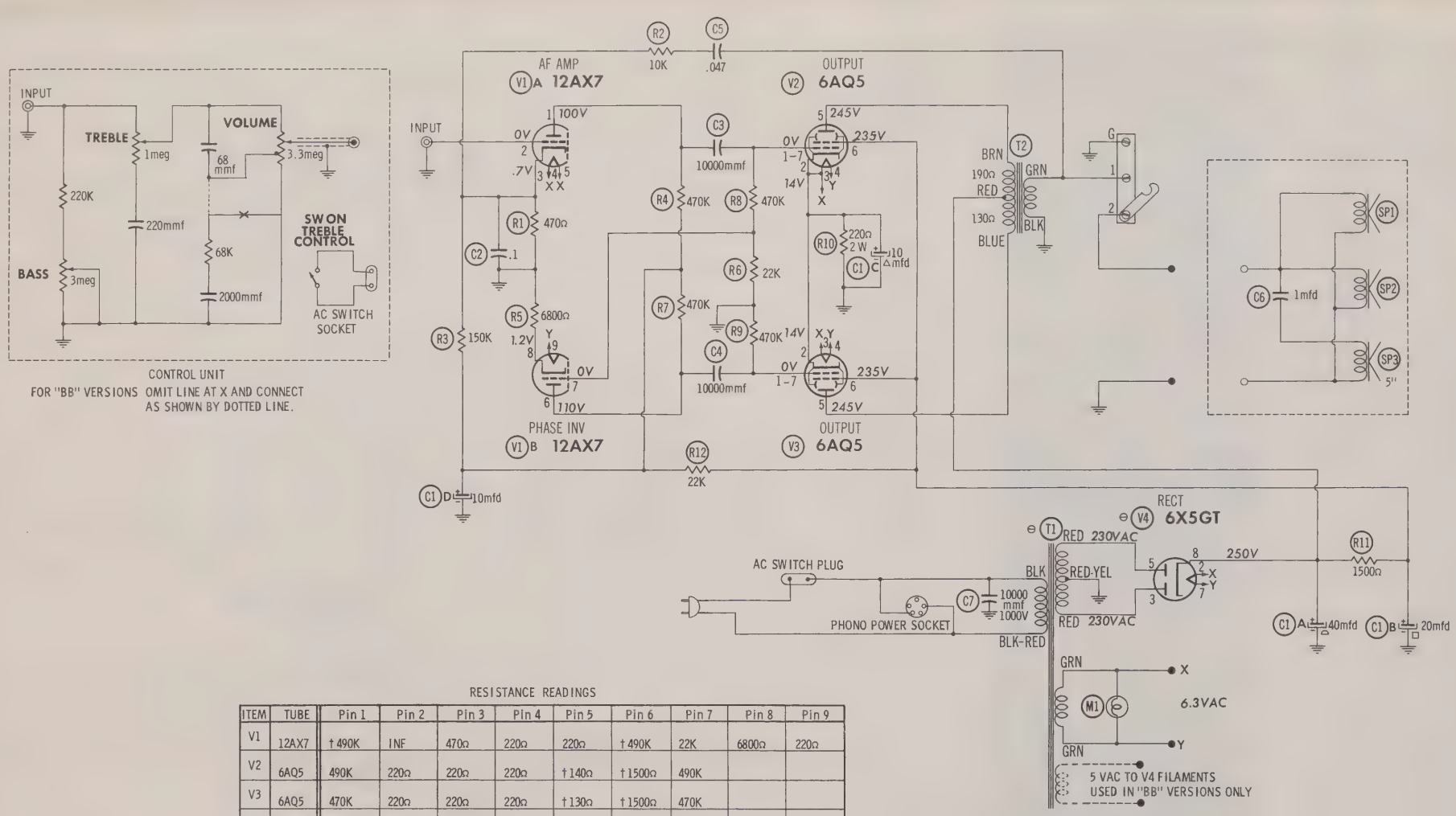
CHASSIS—BOTTOM VIEW



SENTINEL CHASSIS AMP-151AA

SET 362 FOLDER 8

SENTINEL CHASSIS AMP-151AA



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	†490K	INF	470Ω	220Ω	220Ω	†490K	22K	6800Ω	220Ω
V2	6AQ5	490K	220Ω	220Ω	220Ω	†140Ω	†1500Ω	490K		
V3	6AQ5	470K	220Ω	220Ω	220Ω	†130Ω	†1500Ω	470K		
V4	6X5GT	NC	220Ω	165Ω	NC	150Ω	NC	220Ω	18K	

† MEASURED FROM PIN 8 OF V4.
NC NO CONNECTION

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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SILVERTONE MODELS 7065, 7066 (Ch. 528.47800, 528.47900, 567.35015)

PROPERTY OF
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DENVER, COLORADO

SILVERTONE MODELS 7065,
7066 (Ch. 528.47800, 528.47900, 567.35015)

SILVERTONE MODELS 7065,
7066 (Ch. 528.47800, 528.47900, 567.35015)

TRADE NAME	Silvertone Models 7065, 7066 FM-AM Tuner Chassis 528.47800 Audio Amp. Chassis 528.47900 Recorder Elect. Chassis 567.35015 Recorder Mech. Chassis 567.34010 Record Changer 567.41007 (or) 567.41107
SUPPLIER	Sears Roebuck & Co., 925 S. Homan, Chicago, Ill.
TYPE SET	AC Operated FM-AM Tuner With Audio Amplifier, Tape Recorder and 4 Speed Automatic Record Changer
POWER SUPPLY	110-120 Volts AC-60 Cycles
RATING	1.74 Amp. @ 117 Volts AC (200 Watts Total Less Motor) Tuner & Amp. Chassis 1.4 Amp. @ 117 Volts AC (162 Watts) Tape Recorder Chassis .34 Amp. @ 117 Volts AC (38 Watts Less Motor)
TUNING RANGE	-BROADCAST 535 KC -1640KC FREQ. MOD. 88MC-108MC

FOR SERVICE INFORMATION ON RECORDER MECHANICAL CHASSIS-SEE SIMILAR SILVERTONE CHASSIS 567.34006- PHOTOFACT SET 351 FOLDER 17

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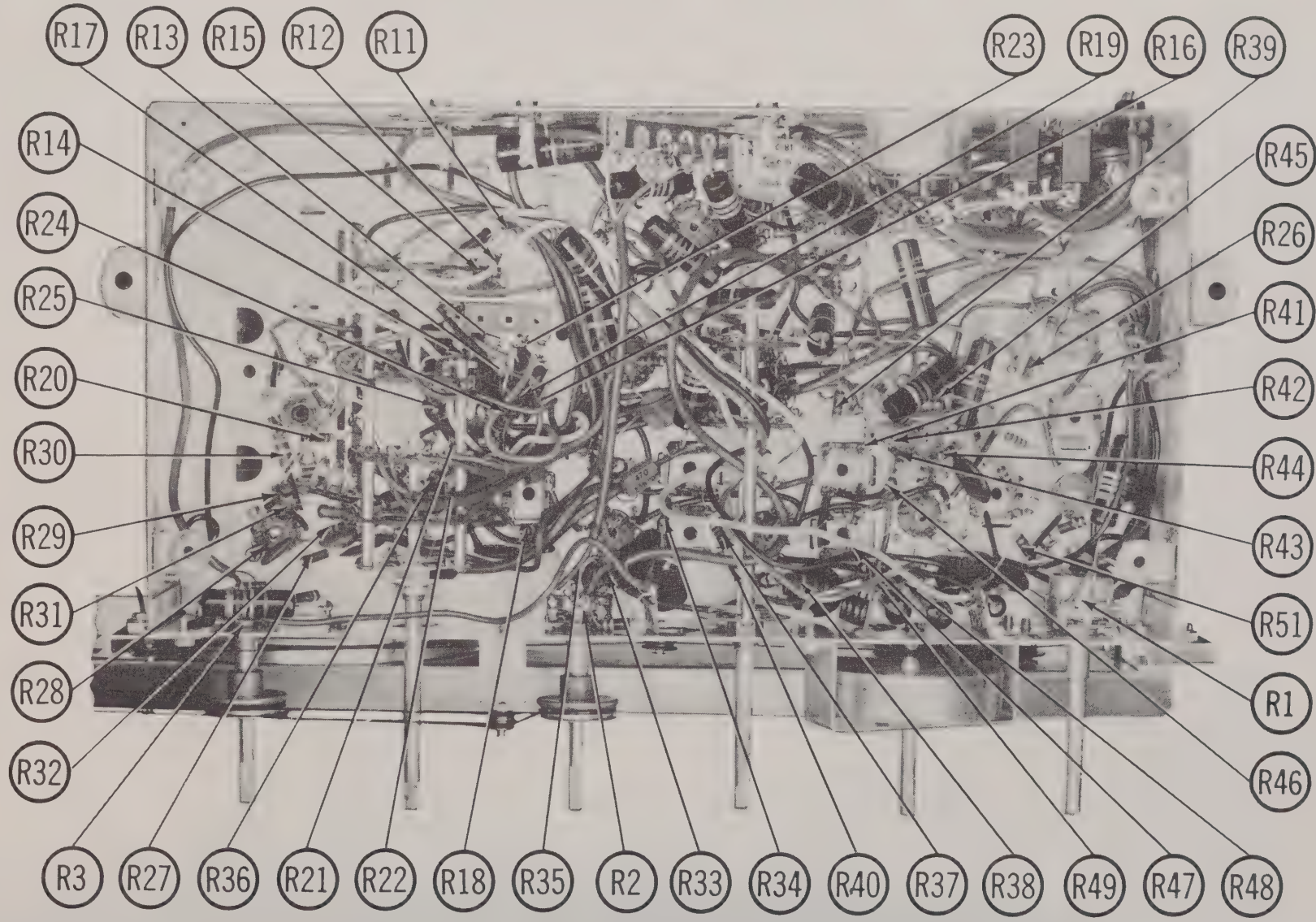
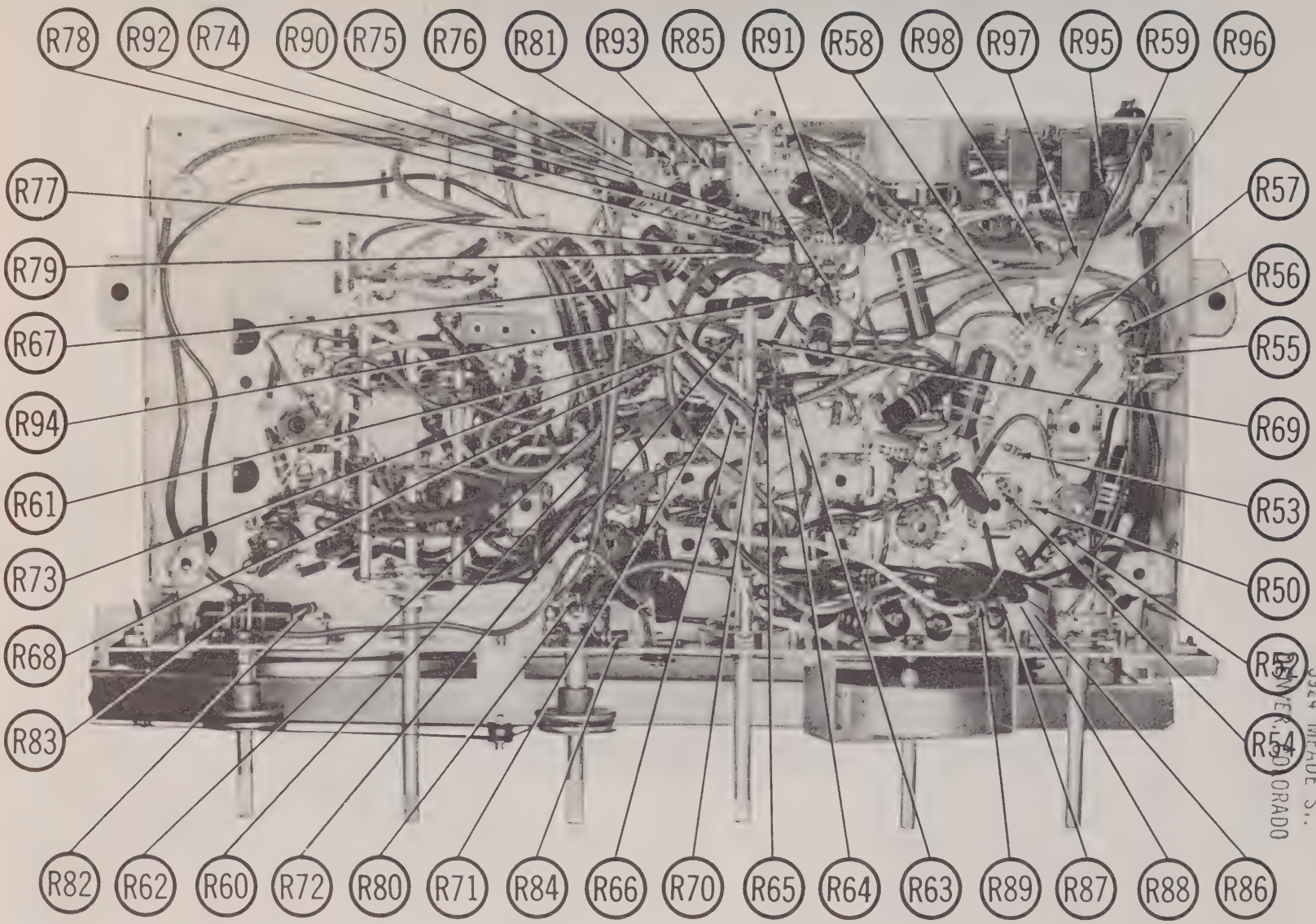


TUNER CHASSIS BOTTOM VIEW - RESISTOR IDENT.



TUNER CHASSIS BOTTOM VIEW - RESISTOR IDENT.

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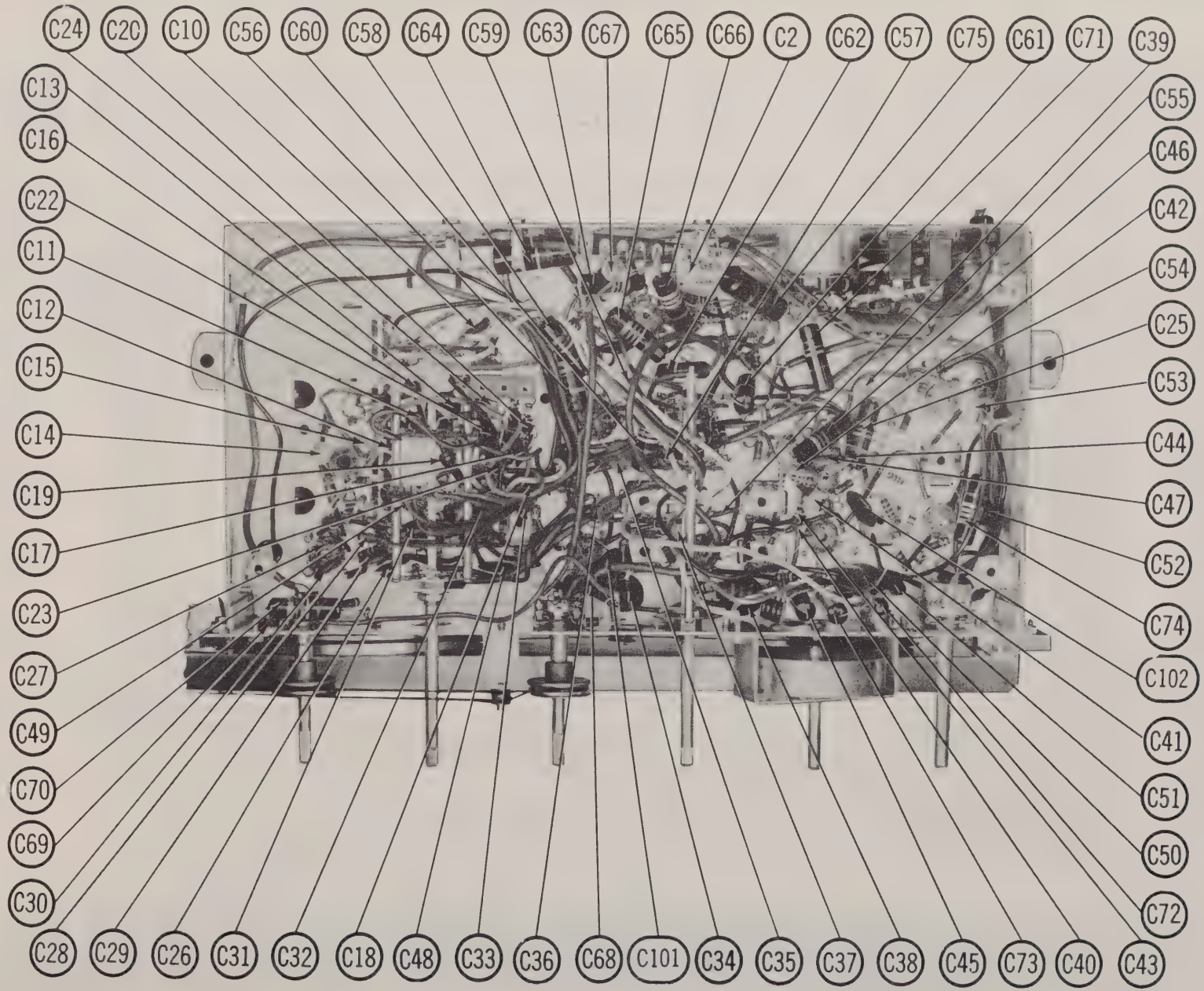
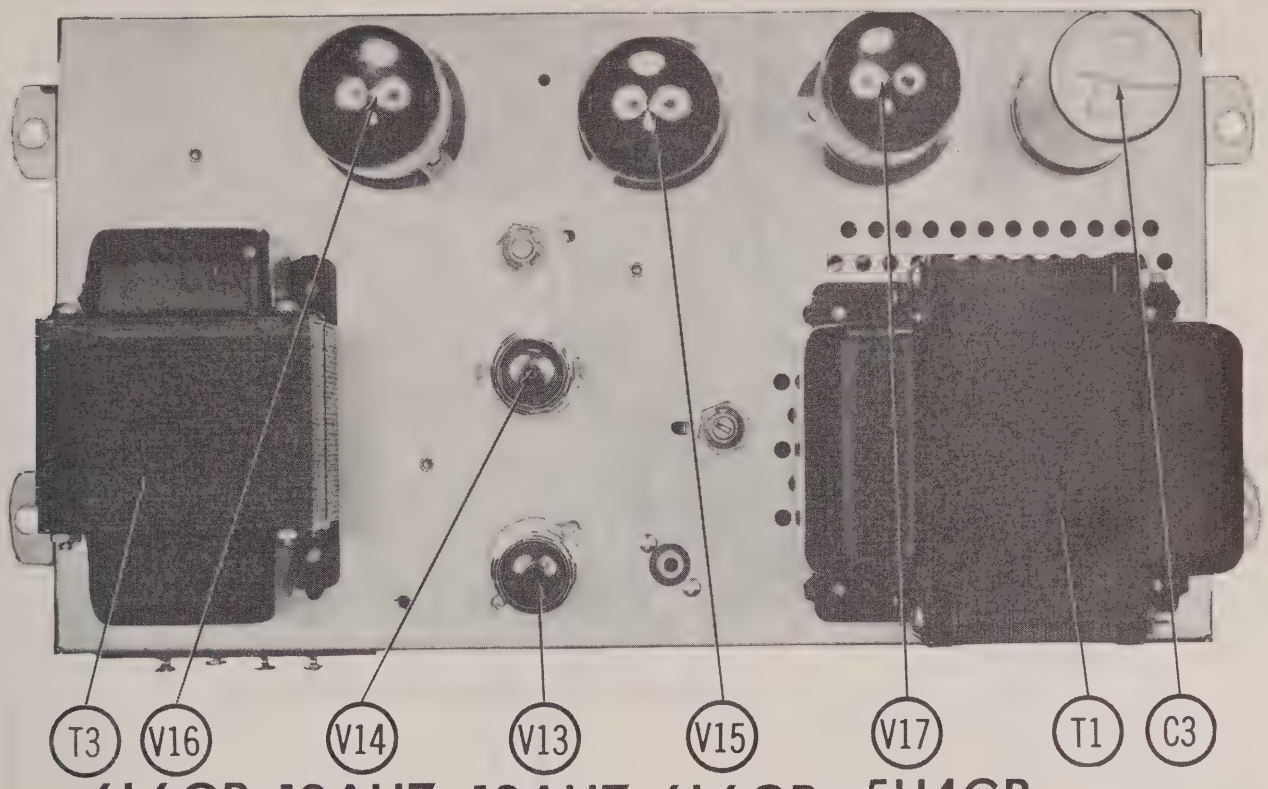


TUNER CHASSIS BOTTOM VIEW - CAPACITOR IDENT.



AMP. CHASSIS - TOP VIEW

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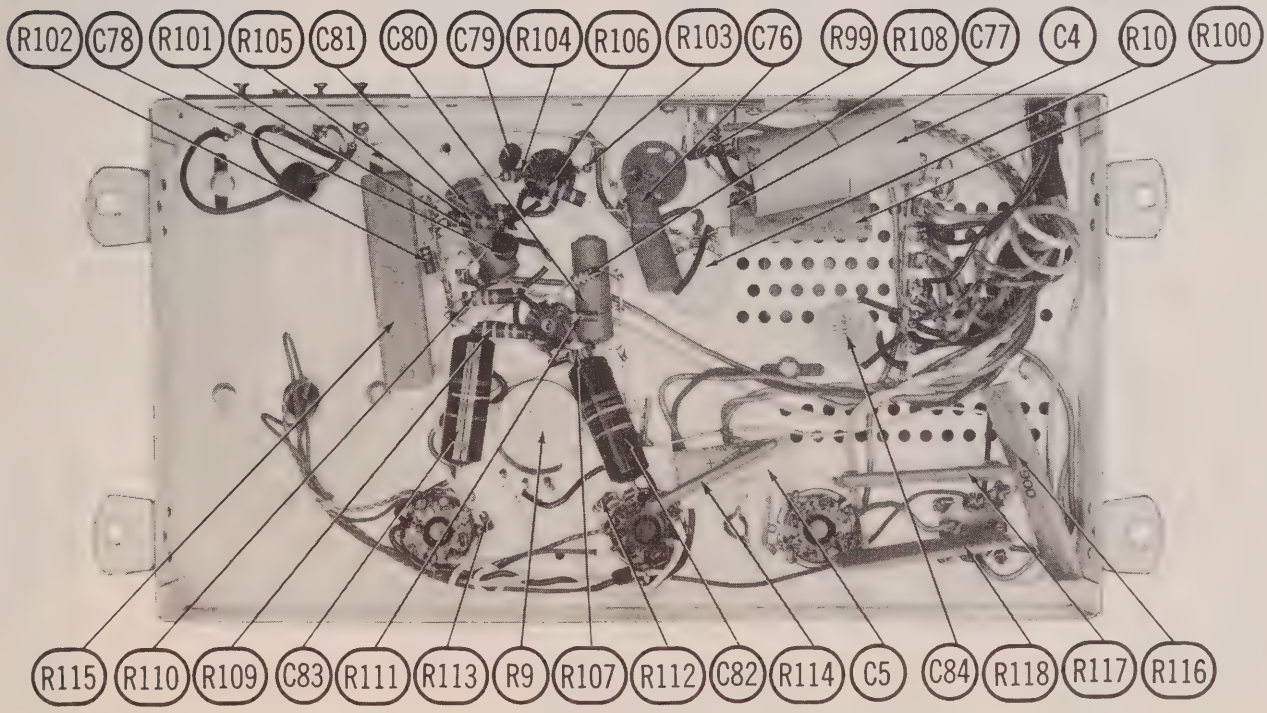
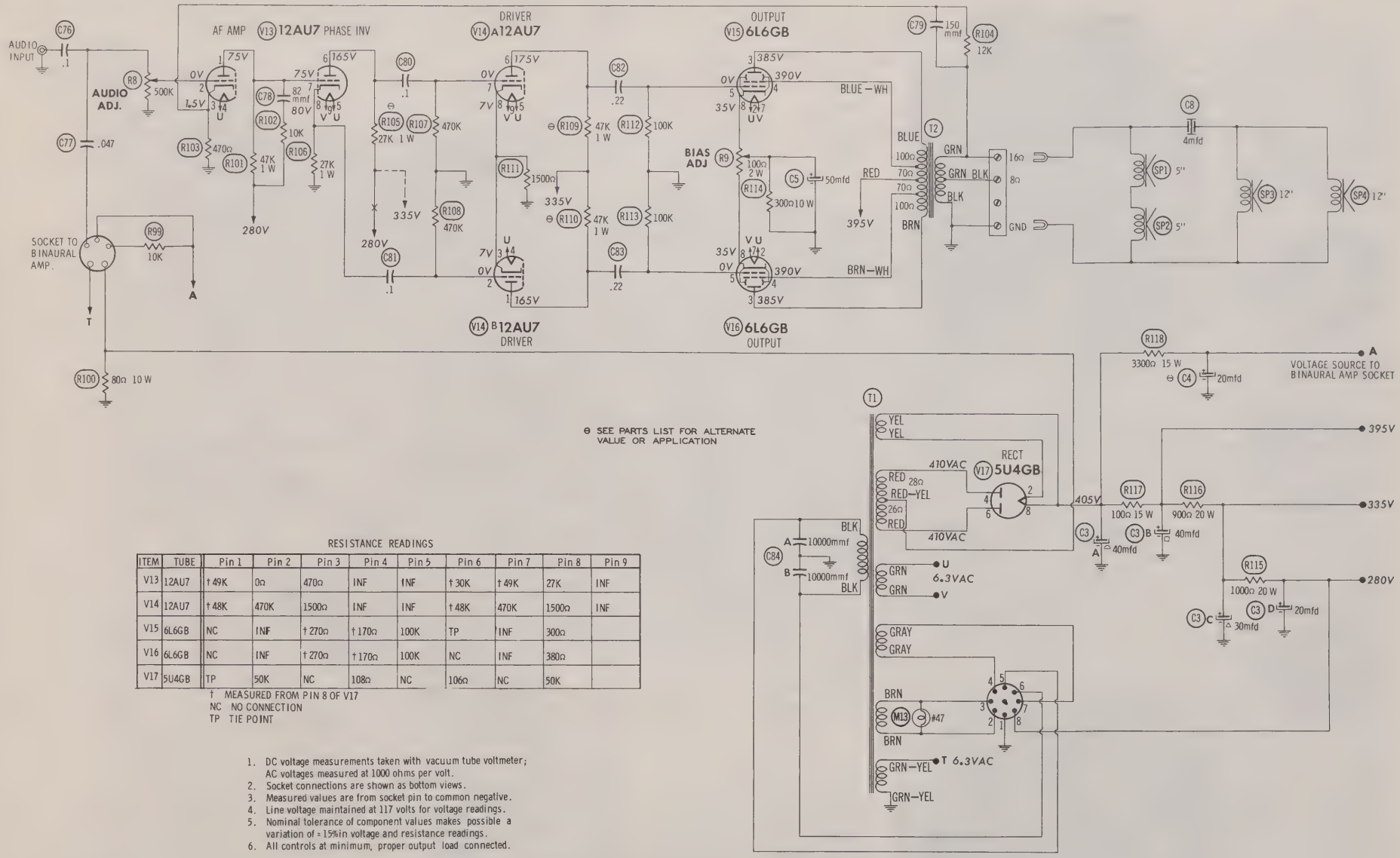
DENVER, COLORADO



AMP. CHASSIS -BOTTOM VIEW



⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V13	12AU7	†49K	0Ω	470Ω	INF	†NF	†30K	†49K	27K	INF
V14	12AU7	†48K	470K	1500Ω	INF	INF	†48K	470K	1500Ω	INF
V15	6L6GB	NC	INF	†270Ω	†170Ω	100K	TP	INF	300Ω	
V16	6L6GB	NC	INF	†270Ω	†170Ω	100K	NC	INF	380Ω	
V17	5U4GB	TP	50K	NC	108Ω	NC	106Ω	NC	50K	

† MEASURED FROM PIN 8 OF V17
NC NO CONNECTION
TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

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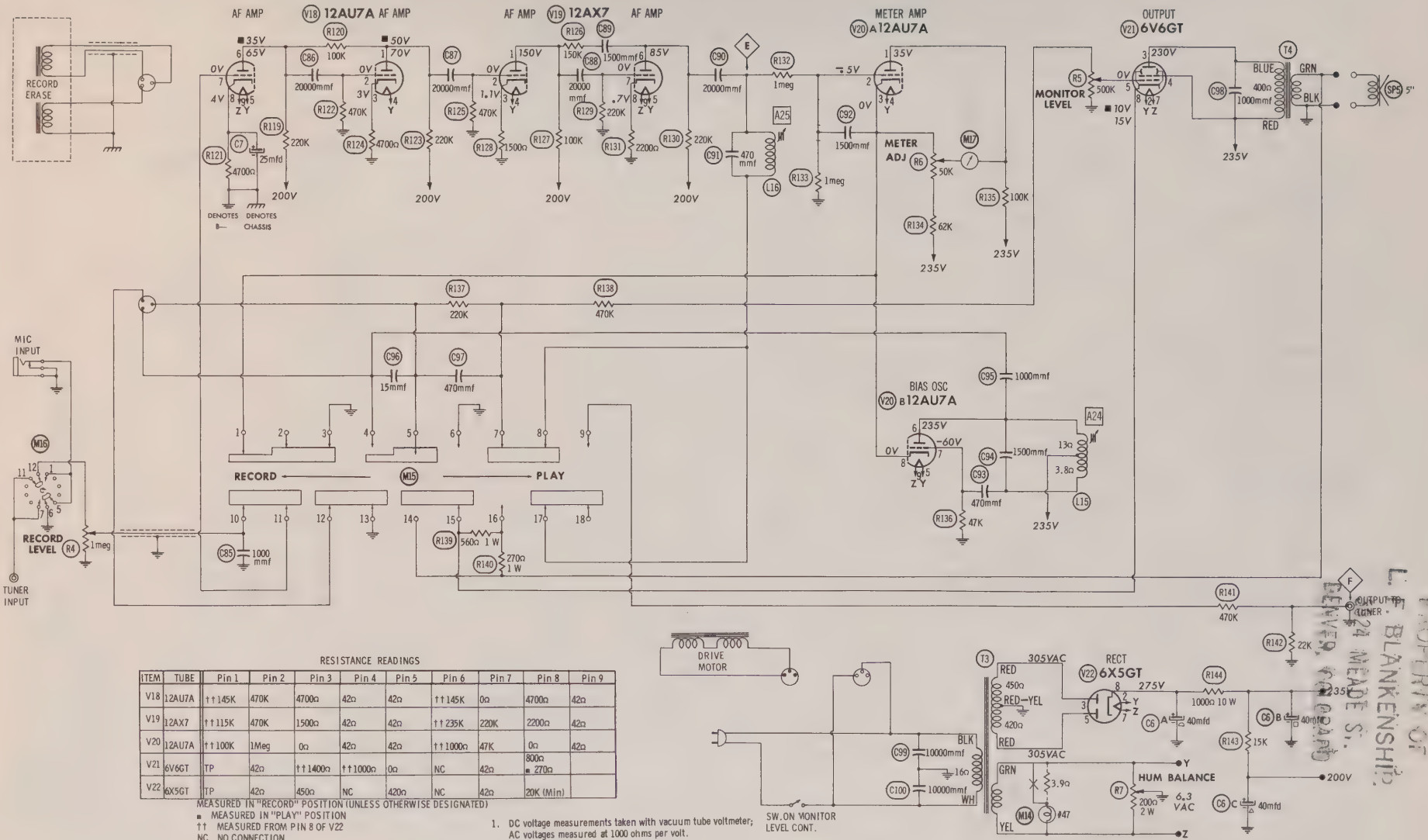

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V18	12AU7A	††145K	470K	4700Ω	42Ω	42Ω	††145K	0Ω	4700Ω	42Ω
V19	12AX7	††115K	470K	1500Ω	42Ω	42Ω	††235K	220K	2200Ω	42Ω
V20	12AU7A	††100K	1Meg	0Ω	42Ω	42Ω	††1000Ω	47K	0Ω	42Ω
V21	6V6GT	TP	42Ω	††1400Ω	††1000Ω	0Ω	NC	42Ω	800Ω ■ 270Ω	
V22	6X5GT	TP	42Ω	450Ω	NC	420Ω	NC	42Ω	20K (Min)	

MEASURED IN "RECORD" POSITION (UNLESS OTHERWISE DESIGNATED)
■ MEASURED IN "PLAY" POSITION
†† MEASURED FROM PIN 8 OF V22
NC NO CONNECTION
TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to commom negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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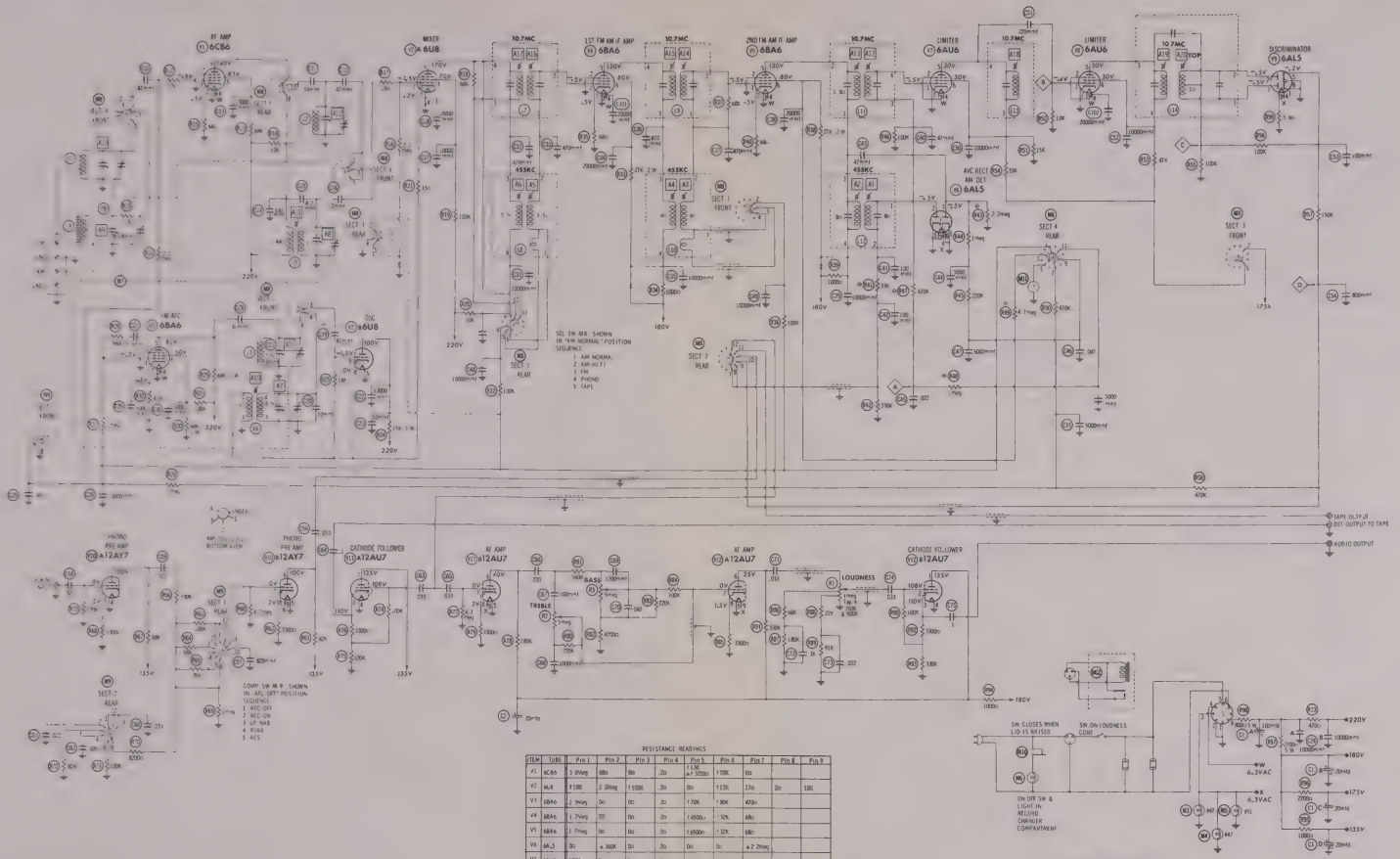

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6CB6	3 Meg	68Ω	0Ω	.2Ω	4.3K at 3000Ω	170K	0Ω		
V2	6U8	118K	2.2Meg	100K	.3Ω	0Ω	113K	270Ω	2Ω	18K
V3	6BA6	2 Meg	0Ω	0Ω	2Ω	170K	180K	470Ω		
V4	6BA6	1.7Meg	111Ω	0Ω	2Ω	1650Ω	32K	68Ω		
V5	6BA6	1.7Meg	0Ω	0Ω	2Ω	1650Ω	32K	68Ω		
V6	6AL5	0Ω	∞ 360K	0Ω	2Ω	0Ω	0Ω	∞ 2.2Meg		
V7	6AU6	100K	0Ω	0Ω	2Ω	125K	125K	0Ω		
V8	6AU6	10K	2Ω	0Ω	2Ω	140K	140K	0Ω		
V9	6AL5	0Ω	100K	2.4Ω	2Ω	260K	0Ω	100K		
V10	12AY7	175K	220K	330Ω	0Ω	0Ω	90K	4.7Meg	330Ω	2Ω
V11	12AU7	5600Ω	430K	33K	0Ω	0Ω	11.8K	4.7Meg	330Ω	2Ω
V12	12AU7	5600Ω	430K	33K	0Ω	0Ω	3.3K	100K	330Ω	2Ω

ALL MEASUREMENTS TAKEN WITH M8 IN "FM" AND M9 IN "AFC-OFF" UNLESS OTHERWISE DESIGNATED
* MEASURED IN "AM-NORMAL"
* MEASURED FROM PIN 8 OF V11 VHT LOCATED ON POWER AMP CHASSIS!

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views
3. Measured values are from socket pin to common negative
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±5% in voltage and resistance readings
6. Volume control at maximum, no signal applied for voltage measurements

* SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC CKTS. RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

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ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.
Use an insulated alignment screwdriver for adjusting.
To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.
(Also see Fig. 4 for dial pointer calibration). All tone controls to mid positions.

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.01MFD	High side to RF stator lug on tuning gang (middle section). Low side to chassis.	455KC (400∿ Mod)	AM (sharp)	Tuning gang fully open	Across 8Ω voice coil	A1, A2, A3, A4, A5, A6	Adjust for maximum output.
2	"	"	455KC (FM Mod. 30KC Sweep)	AM (broad)	Point of non-interference	Vert amp. of scope across 'output to tape' jack.	A1	Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.
3	Direct	High side to external ant. connection (AM). Low side to chassis	1400KC (400∿ Mod)	AM (sharp)	1400KC	Across 8Ω voice coil	A7, A8 A9	Adjust for maximum output
4	"	"	600KC	"	600KC	"	A10, A11	"

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
5	Direct	High side to ungrounded tube shield on 6U8 (V2). Low side to chassis.	10.7MC (unmod.)	FM (AFC off)	Point of non-interference	DC probe to point Ⓐ. Common to chassis.	A12, A13, A14, A15, A16, A17	Adjust for maximum deflection.
6	"	"	"	"	"	DC probe thru 1Meg to point Ⓑ. Common to chassis.	A18	"
7	"	"	"	"	"	DC probe to point Ⓒ. Common to chassis.	A19	Detune A20 and adjust A19 for maximum deflection.
8	"	"	"	"	"	DC probe to point Ⓓ. Common to chassis.	A20	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Remove 6U8 (V2) from set and insert A6U8 with pin 1 (plate) clipped off.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
5	Direct	High side to ungrounded tube shield on 6U8 (V2). Low side to chassis.	10.7MC (300KC Swp.)	FM (AFC off)	Point of non-interference.	Vert amp. to point Ⓐ. Low side to chassis.	A12, A13, A14, A15, A16, A17	Adjust for curve of maximum amplitude and symmetry similar to Fig. 2.
6	"	"	"	"	"	Vert amp. thru 25K to point Ⓑ. Low side to chassis.	A18	"
7	"	"	"	"	"	Vert amp. to point Ⓒ. Low side to chassis.	A19	"
8	"	"	"	"	"	Vert amp. to point Ⓓ. Low side to chassis.	A20	Adjust so that 10.7MC occurs at center of crossover lines similar to Fig. 3. SLIGHTLY retouch A19 for maximum amplitute and straightness of crossover lines.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
9	Two 120Ω Carbon Resistors	Across FM ant. terminals with 120Ω in each lead.	106MC (unmod.)	FM (AFC off)	106MC	DC probe to point Ⓐ. Common to chassis.	A21, A22 A23	Adjust for maximum deflection in order given.

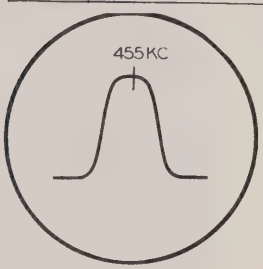


FIG. 1

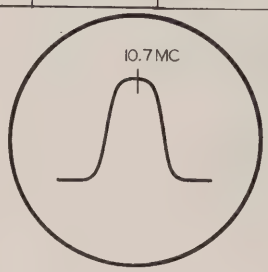


FIG. 2

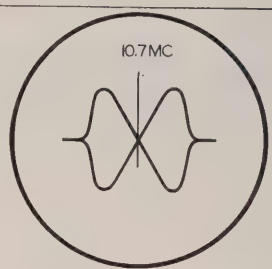


FIG. 3

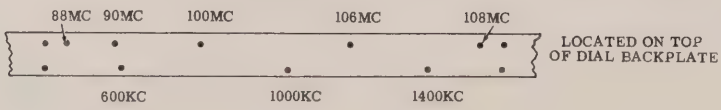
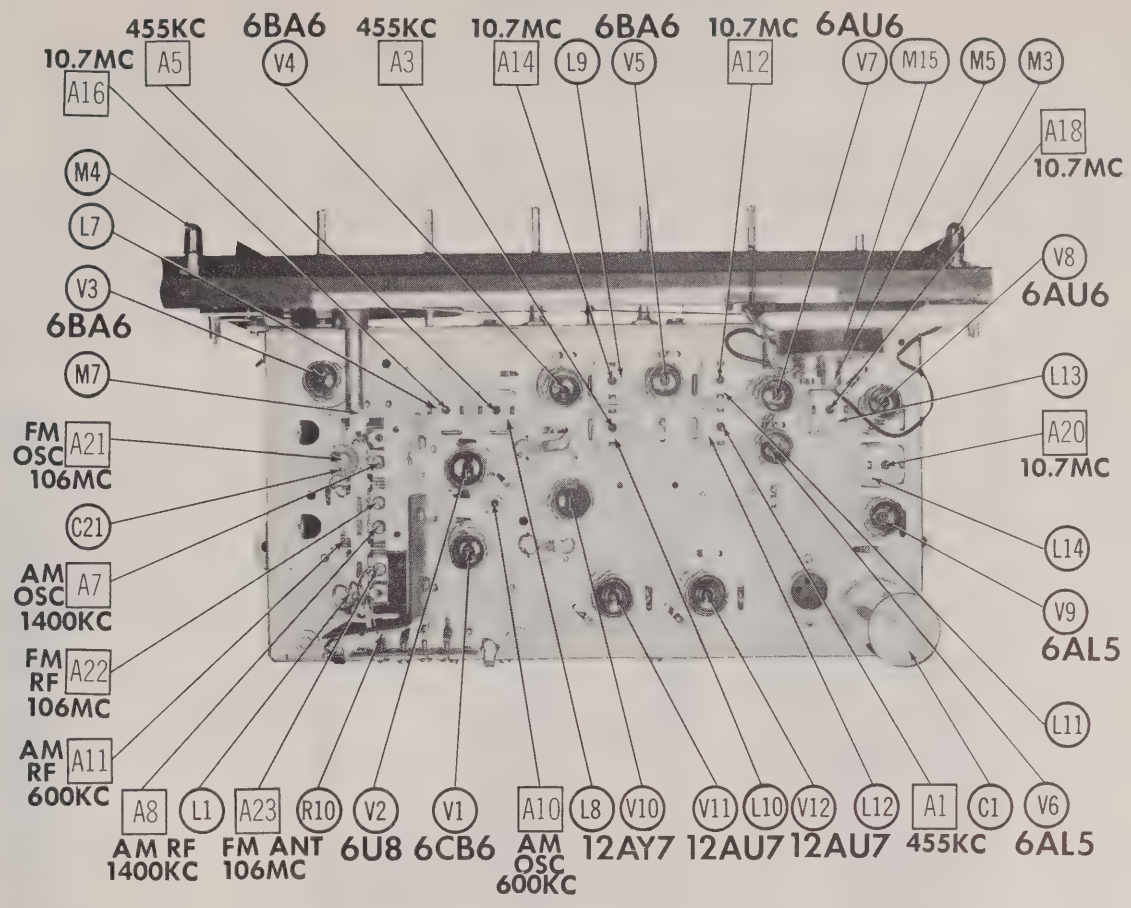
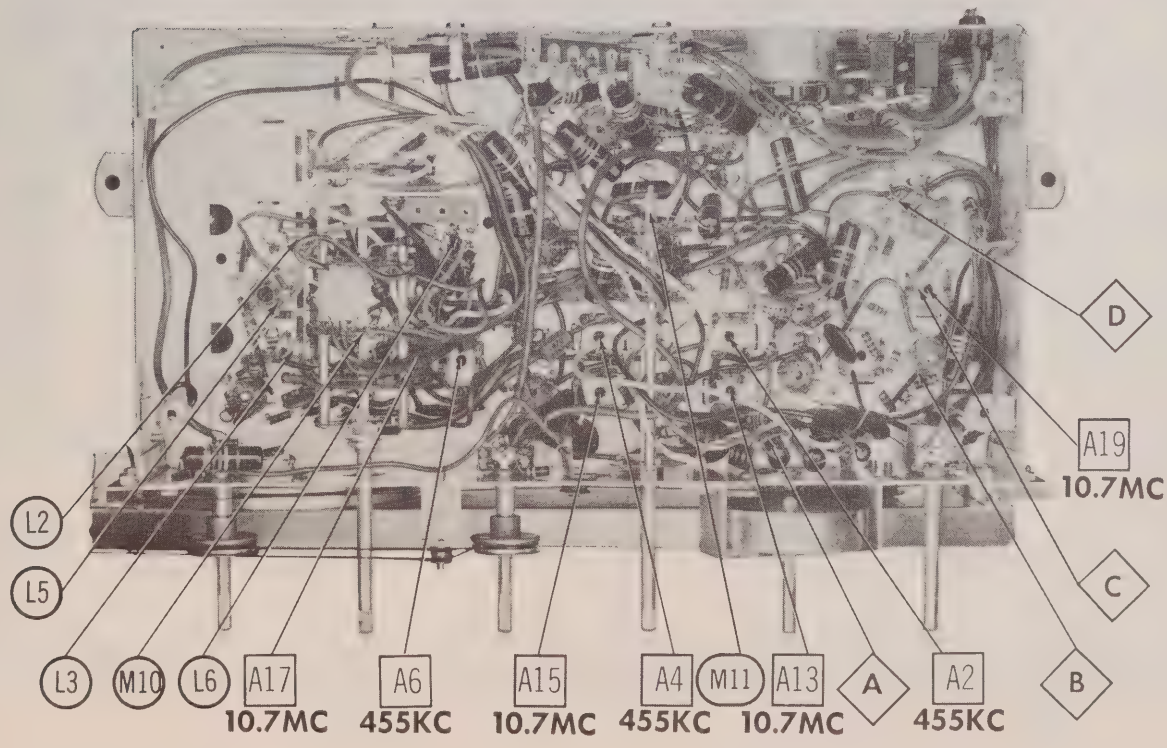


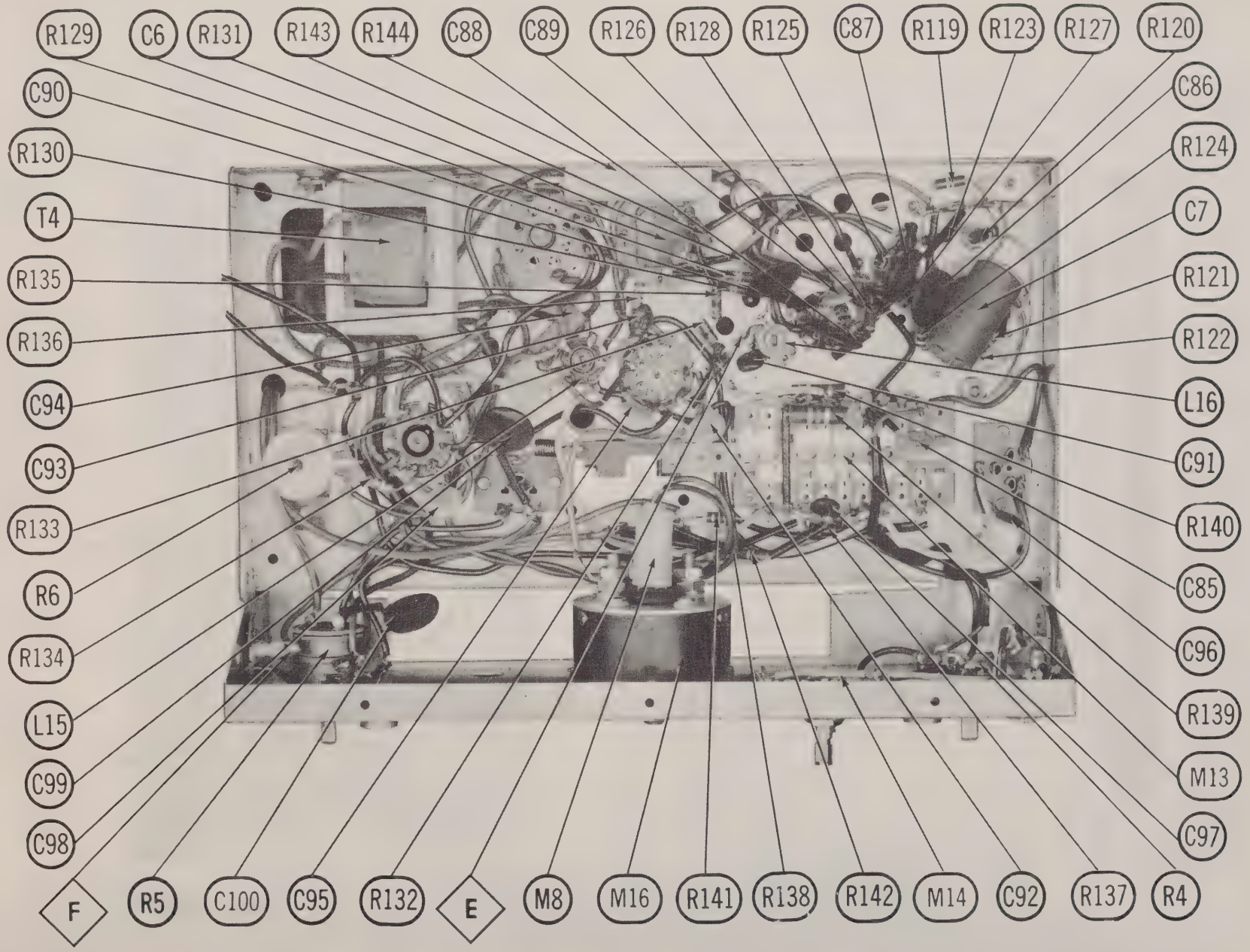
FIG. 4



TUNER CHASSIS - TOP VIEW



TUNER CHASSIS BOTTOM VIEW - ALIGN. & INDUCTOR IDENT.



RECORDER CHASSIS - BOTTOM VIEW

ADJUSTMENTS

RECORDER AMPLIFIER ADJUSTMENTS

NOTE: Adjustments should be made if components are changed or repaired. Adjustments should be periodically checked.

Adjustments are made with set on, tape recorder in record position and no signal applied.

OSCILLATOR COIL (A24)
Using frequency meter, adjust A24 to 52.5KC.

METER ADJUSTMENT (R6)
Adjust needle so that it is directly over black dot at left side of meter. When properly adjusted needle should have a slight movement when set is turned on and off.

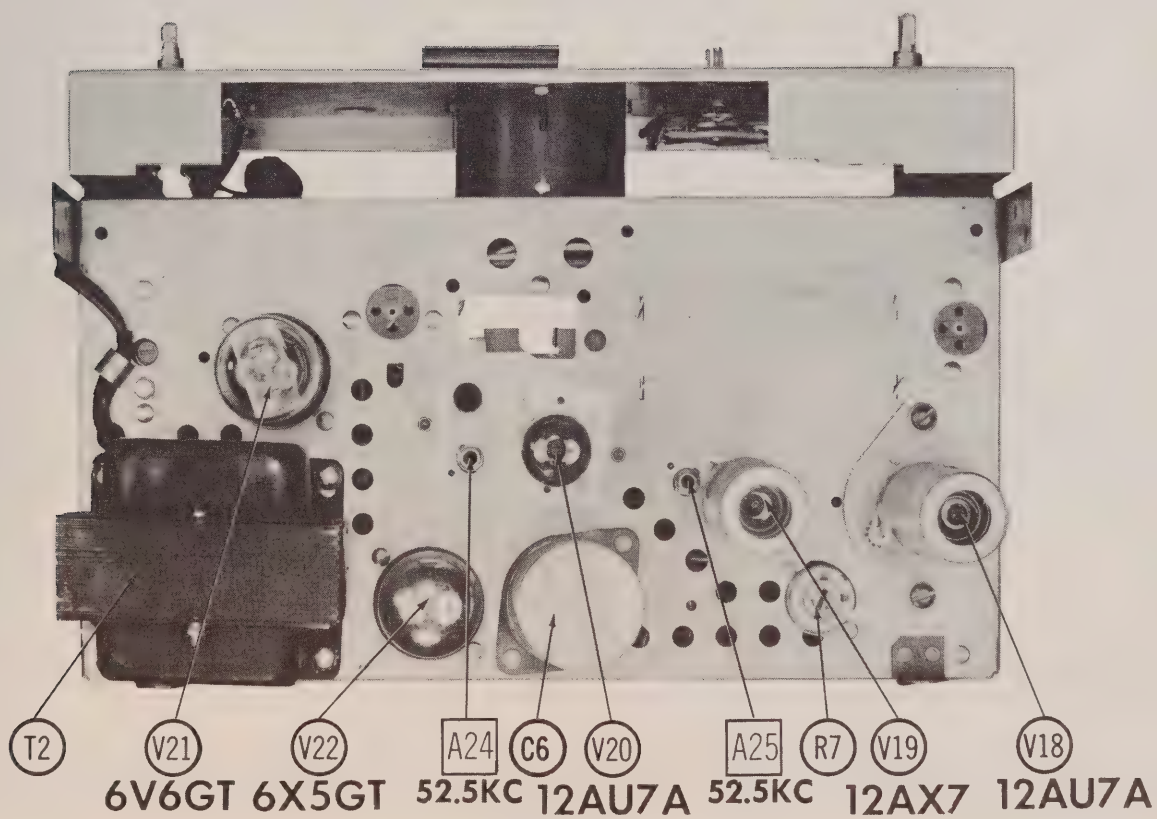
52.5KC TRAP (A25)
Set volume control to extreme counter clockwise position. Short pin 2 (grid) of 12AX7 (V19) to chassis. Connect AC VTVM to point (E), common to chassis. Adjust A25 for minimum deflection on VTVM.

HUM ADJUSTMENT (R7)
Adjust hum control for minimum deflection with AC VTVM across output to tuner jack (point (F)).

AUDIO AMPLIFIER ADJUSTMENTS

AUDIO INPUT CONTROL ADJUSTMENT (R8)
This adjustment should be made after any repair in the audio section of the power chassis. Connect an audio signal generator to the audio input jack. Connect an output meter from the 16Ω lead of output transformer to ground. Adjust signal generator output to 1.25 volts@ 400-1000~. Adjust R8 for 20 watts (18 volts on output meter).

BIAS CONTROL ADJUSTMENT (R9)
This adjustment should be made if V15 or V16 tubes or associated components are replaced. Connect a DC voltmeter from ground to pin 8 (cathode) of each of the 6L6GT output tubes (V15 & 16). Short audio input jack to ground. Adjust R9 so that cathode voltages are equal (approximately 30 volts).



RECORDER CHASSIS TOP VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amplifier	6CB6	
V2	Mixer-Cscillator	6U8	
V3	FM AFC	6BA6	
V4	1st. IF Amplifier	6BA6	
V5	2nd. IF Amplifier	6BA6	
V6	AM Detector-AVC Rect.	6AL5	
V7	1st. Limiter	6AU6	
V8	2nd. Limiter	6AU6	
V9	Discriminator	6AL5	
V10	Phono Preamplifier	12AY7	
V11	Cath. Follower-AF Amp.	12AU7	

ITEM No.	USE	TYPE	NOTES
V12	AF Amp.-Cath. Follower	12AU7	
V13	AF Amp.-Phase Inv.	12AU7	
V14	Driver	12AU7	
V15	Output	6L6GB	
V16	Output	6L6GB	
V17	Rectifier	5U4GB	
V18	AF Amplifier	12AU7A	
V19	AF Amplifier	12AX7	
V20	Meter-Amplifier-Bias Osc.	12AU7A	
V21	Output	6V6GT	
V22	Rectifier	6X5GT	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA SILVERTONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲100	300	18-15-3	AFH4-88-80	CO270	FP422.9	TMQ-121	Q-040	R2397 *
B	▲20	300			BR10035	TC62	TD-40-350	MT-4580	
C	20	300							
D	■20	300							
C2	20	300	18-22-0	PRS450V20	BR2035	TC65	TD-20-350	FM-4520	TVA-1608
C3A	▲40	475	18-29-3		DO176	FP396.14	TMQ-123	D-275	R2396 *
B	■40	475				TC78	TD-30-450	FMD-430	
C	▲30	450							
D	20	450							
C4	20	450	18-5-08 (Note 1)	PRS450V20	BR2045	TC75	TD-20-450	FM-4520	TVA-1709
C5	50	150	18-41-0	PRS150V50	BR5015	TC49	TD-50-150	FM-1550	TVA-1414
C6A	▲40	300	770088	AFH3-44	DO020	FP217.87	TMT-23	T-170	TVL-3787
B	■40	300				TC78			
C	▲40	300							
C7	25	25	770003	PRS25V25	BBR25-25	TC26	TD-25-25	FM-0225	TVA-1205
C8	4	150NP	770158	PRS450VNP4	BBR8-150 †	TC41 †	TD-8-150 †	MT-1508 †	R1251 *
					BBR8-150	TC41	TD-8-150	MT-1508	

Note 1. Some versions may use 10MFD in this application (Part #18-5-0)

* Non-catalog item.

† Connect negative leads together.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA SILVERTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C9	8-28		19-180-0							
C10	47		15-470611	NP0-SI 47	TCZ-47	C10Q47C	TCO-47		5TCC-Q47	NP0
C11	33		15-330611	NP0-SI 33	TCZ-33	C10Q33C	TCO-33	ZT-5433	5TCC-Q33	NP0
C12	47		15-470611	NP0-SI 47	TCZ-47	C10Q47C	TCO-47		5TCC-Q47	NP0
C13	10000		15-10317	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C14	330		15-33161	BPD-00033	DD-331	L10T33	ED-330	UC-5333	5GA-T33	
C15	4.7		20-23-0	NP0-SI 4.7	TCZ-4R7	C10V47C	TCO-4.7	ZT-5547	5TCCB-V47	10%
C16	12		15-120611		TCZ-12		TCO-12			NP0
C17	10000		15-10317	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C18	10000		15-10317	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C19	47		15-470115							N1400
C20	10		15-100614	N750-SI 10	TCN-10	C10QIU	TC7-10	NT-541	5TCU-QI	N750
C21	2.5-13		19-3-5							
C22	10000		15-10317	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C23	10		20-14-0	BPD-00001	DD-100	LT6QI	ED-10	UC-541	5GA-QI	10%
C24A	10000		15-10318	BPD-2X01	DD3-103	BYD6DS1	ED-01	DC511	5HK-2S1	
B	10000						ED-01	DC511		
C25	.047	200	16-47327	BPD-05	DF-503	CUB2S47		GEM-4147	2TM-S47	
C26	10000		15-10317	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C27	3.3		20-45-0	NP0-SI 3.3	TCZ-3R3	C10V33C	TCO-3.3	ZT-5533	5TCCB-V33	10%
C28	47		15-470611	NP0-SI 47	TCZ-47	L10Q47C	TCO-47		5TCC-Q47	10%
C29	5000		15-50217	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C30	5000		15-50217	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C31	10000		15-10317	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C32	470		20-7-2	1464-00047		5R5T47			MS-347	5%
C33	470		20-7-2	1464-00047		5R5T47			MS-347	5%

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA SILVERTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C34	20000		15-20317	BPD-02	DD-203	BYB6S2	ED-02			
C35	10000		15-10317	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C36	470		20-7-2	1464-00047		5R5T47			MS-347	5%
C37	470		20-7-2	1464-00047		5R5T47			MS-347	5%
C38	20000		15-20317	BPD-02	DD-203	BYB6S2	ED-02			
C39	10000		15-10317	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C40	47		15-47011	BPD-000047	DD-470	L10Q47	ED-47	UC-5447	5GA-Q47	
C41	100		15-10111	N750-SI 100	TCN-100	C10T1U	TC7-100	NT-531	5TCU-T1	N750
C42	100		15-10111	N750-SI 100	TCN-100	C10T1U	TC7-100	NT-531	5TCU-T1	N750
C43	47		15-47011	BPD-000047	DD-470	L10Q47	ED-47	UC-5447	5GA-Q47	
C44	5000		15-50217	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C45	.022	200	16-22328	BPD-02	DD-203	CUB4S22	ED-02	GEM-4122	2TM-S22	
C46	.047	200	16-47327	BPD-05	DF-503	CUB2S47		GEM-4147	2TM-S47	
C47	5000		15-50217	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C48	10000		15-10317	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C49	10000		15-10317	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C50	20000		15-20317	BPD-02	DD-203	BYB6S2	ED-02			
C51	220		15-22111	BPD-00022	DD-221	L10T22	ED-220	UC-5322	5GA-T22	
C52	10000		15-10317	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C53	100		15-10111	BPD-0001	DD-101	L10T1	ED-100	UC-531	5GA-T1	
C54	800		15-80111	BPD-0008	DD-801	L10T8	ED-800		5GA-T8	
C55	5000		15-50217	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C56	.033	400	16-33348	BPD-03	DF-303	CUB6S33		GEM-6133	6TM-S33	
C57	820		15-82111	SI 820	D6-821	BYA10T82	ED-820		5GA-T82	
C58	.022	200	16-22328	BPD-02	DD-203	CUB4S22	ED-02	GEM-4122	2TM-S22	
C59	.022	200	16-22328	BPD-02	DD-203	CUB4S22	ED-02	GEM-4122	2TM-S22	
C60	.033	200	16-33328	BPD-03	DF-303	CUB6S33		GEM-6133	6TM-S33	
C61	.022	200	16-22327	BPD-02	DD-203	CUB4S22	ED-02	GEM-4122	2TM-S22	
C62	.005	200	16-50227	BPD-005	D6-502	CUB6D5	GP-5000	GEM-625	6TM-D5	
C63	.033	200	16-33328	BPD-03	DF-503	CUB6S33		GEM-6133	6TM-S33	
C64	.1	400	16-10448	P488N-1	DF-104	CUB4P1		GEM-401	4TM-P1	
C65	.033	200	16-33328	BPD-03	DF-303	CUB6S33		GEM-6133	6TM-S33	
C66	.033	400	16-33348	BPD-03	DF-303	CUB6S33		GEM-6133	6TM-S33	
C67	100		15-10111	N750-SI 100	TCN-100	C10T1U	TC7-100	NT-531	5TCU-T1	N750
C68	1000		15-10211	BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	
C69	1200		15-12211	SI 1200	D6-122	L10D12	ED-0012	UC-5212	5HK-D12	
C70	.047	200	16-47328	BPD-05	DF-503	CUB2S47		GEM-4147	2TM-S47	
C71	.033	400	16-33348	BPD-03	DF-303	CUB6S33		GEM-6133	6TM-S33	
C72	.01	200	16-10328	BPD-01	DD-103	CUB4S1	GP-10000	GEM-411	4TM-S1	
C73	.022	200	16-22327	BPD-02	DD-203	CUB4S22	ED-02	GEM-4122	2TM-S22	
C74	.033	200	16-33327	BPD-03	DF-303	CUB4S33		GEM-6133	6TM-S33	
C75	.1	400	16-10448	P488N-1	DF-104	CUB4P1		GEM-401	4TM-P1	
C76	.1	400	16-10448	P488N-1	DF-104	CUB4P1		GEM-401	4TM-P1	
C77	.047	400	16-47348	BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	
C78	82		15-82011	SI 82	D6-820	L10Q82	ED-82		5GA-Q82	
C79	150		15-15111	BPD-00015	DD-151	L10T15	ED-150	UC-5315	5GA-T15	
C80	.1	400	16-10448	P488N-1	DF-104	CUB4P1		GEM-401	4TM-P1	
C81	.1	400	16-10448	P488N-1	DF-104	CUB4P1		GEM-401	4TM-P1	
C82	.22	400	16-22448	P488N-22		CUB4P22		GEM-4022	4TM-P22	
C83	.22	400	16-22448	P488N-22		CUB4P22		GEM-4022	4TM-P22	
C84A	10000		15-10318	BPD-2X01	DD3-103	BYD6DS1	ED-01	DC511	5HK-2S1	
B	10000						ED-01	DC511		
C85	1000	1000	770140	HVD-15-1000	DD30-102	BYA10D1M	HD15-1000	DC3021	10HKB-D1	
C86	20000		770092	BPD-02	DD-203	BYB6S2	ED-02		5HK-S2	
C87	20000		770092	BPD-02	DD-203	BYB6S2	ED-02		5HK-S2	
C88	20000		770092	BPD-02	DD-203	BYB6S2	ED-02		5HK-S2	
C89	1500		770098	BPD-0015	DD-152	BYA10D15	ED-0015	DC5215	5HK-D15	
C90	20000		770092	BPD-02	DD-203	BYB6S2	ED-02		5HK-S2	
C91	470		770090	BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	5GA-T47	
C92	1500		770098	BPD-0015	DD-152	BYA10D15	ED-0015	DC5215	5HK-D15	
C93	470		770090	BPD-0047	DD-471	BYA10T47	ED-470	UC-5347	5GA-T47	
C94	1500	500		1467-0015		1R5D15		MCE456	MS-215	5%
C95	1000	1000	770140	HVD-15-1000	DD30-102	BYA10D1M	HD15-1000	DC3021	10HKB-D1	
C96	15		770165	BPD-000015	DD-150	L10Q15	ED-15	UC-5415	5GA-Q15	
C97	470		770090	BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	5GA-T47	
C98	1000	1000	770140	HVD-15-1000	DD30-102	BYA10D1M	HD15-1000	DC3021	10HKB-D1	
C99	10000	1500	770105	P1688N-01		CUB16S1		GEM-1611	16TM-S1	
C100	10000	1500	770105	P1688N-01		CUB16S1		GEM-1611	16TM-S1	
C101	20000		770092	BPD-02	DD-203	BYB6S2	ED-02		5HK-S2	
C102	20000		770092	BPD-02	DD-203	BYB6S2	ED-02		5HK-S2	

PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	SILVERTONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	1Meg	½	24-256				UDT-289	Loudness-Tap② 350K &500K
B	Shaft						Not req.	
C	Switch						US-26	
R2A	5Meg	½	26-139	B-87	A47-5Meg-S	Q11-141	U67	Treble
B	Shaft			Not req.	FS-3	Not req.	Not req.	
R3A	5Meg	½	26-139	B-87	A47-5Meg-S	Q11-141	U67	Bass
B	Shaft			Not req.	FS-3	Not req.	Not req.	
R4A	1Meg	½	740073	B-70	A47-1Meg-Z	Q13-137	U53	Record Level
B	Shaft			Not req.	KSS-3	Not req.	Not req.	
R5A	500K	½	740078	B-60	A47-500K-Z	Q13-133	U48	Monitor Level
B	Shaft			Not req.	KSS-3	Not req.	Not req.	
C	Switch			KB-1	SWE-12	76-1	US-26	
R6A	50K	½	740079	BX-31				Meter Adjust
B	Shaft			Not req.				
R7	200Ω	2	740045					Hum Balance (wire wound)
R8A	500K	½	25-100	AB-59	A47-500K-S	Q11-133	U50	Audio Input Adjust
B	Shaft			AK-1	FKS-1/4	RQ	Not req.	
R9A	100Ω	2	25-99	WN-101	A43-100	WPK100	R100L	Bias Adjust (wire wound)
B	Shaft			Not req.	FKS-1/4	Not req.	Not req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SILVERTONE PART No.	IRC PART No.	
R10	3.3Ω 5%		60-33901		
R11	2.2Meg		60-22501	BTS-2.2Meg	
R12	10Ω		60-10001	BTS-10	
R13	68K		60-68301	BTS-68K	
R14	10K		60-10301	BTS-10K	
R15	68Ω		60-68001	BTS-68	
R16	2.2Meg		60-22501	BTS-2.2Meg	
R17	10Ω		60-10001	BTS-10	
R18	68K		60-68301	BTS-68K	
R19	100K		60-10401	BTS-100K	
R20	10K		60-10301	BTS-10K	
R21	15Ω		60-15001	BTS-15Ω	
R22	100K		60-10401	BTS-100K	
R23	470Ω		60-47101	BTS-470	
R24	15K	1	60-15311	BTA-15K	
R25	18K		60-18301	BTS-18K	
R26	1Meg		60-10501	BTS-1Meg	
R27	1Meg		60-10501	BTS-1Meg	
R28	560Ω		60-56101	BTS-560	
R29	68K	1	60-68311	BTA-68K	
R30	68K	1	60-68311	BTA-68K	
R31	100K		60-10401	BTS-100K	
R32	470Ω		60-47101	BTS-470	
R33	27K	2	60-27321	BTB-27K	
R34	1000Ω		60-10201	BTS-1000	
R35	68Ω		60-68001	BTS-68	
R36	100K		60-10401	BTS-100K	
R37	68K		60-68301	BTS-68K	
R38	27K	2	60-27321	BTB-27K	
R39	1000Ω		60-10201	BTS-1000	
R40	68Ω		60-68001	BTS-68	
R41	33K		60-33301	BTS-33K	
R42	330K		60-33401	BTS-330K	Note 1
R43	2.2Meg		60-22501	BTS-2.2Meg	
R44	1Meg		60-10501	BTS-1Meg	Note 2
R45	220K		60-22401	BTS-220K	
R46	100K		60-10401	BTS-100K	
R47	470K		60-47401	BTS-470K	
R48	1Meg		60-10501	BTS-1Meg	Note 2
R49	4.7Meg		60-47501	BTS-4.7Meg	Note 1
R50	470K		60-47401	BTS-470K	
R51	15K		60-15301	BTS-15K	
R52	10K		60-10301	BTS-10K	
R53	47K		60-47301	BTS-47K	
R54	33K		60-33301	BTS-33K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SILVERTONE PART No.	IRC PART No.	
R55	100K		60-10401	BTS-100K	
R56	100K		60-10401	BTS-100K	
R57	150K		60-15401	BTS-150K	
R58	470K		60-47401	BTS-470K	
R59	5.6Ω 5%		60-56905		
R60	4.7Meg		60-47501	BTS-4.7Meg	
R61	82K		60-82301	BTS-82K	
R62	3300Ω		60-33201	BTS-3300	
R63	100K 5%		60-10405	BTS-100K 5%	
R64	68K 5%		60-68305	BTS-68K 5%	
R65	39K 5%		60-39305	BTS-39K 5%	
R66	330K 5%		60-33405	BTS-330K 5%	
R67	68K		60-68301	BTS-68K	
R68	3300Ω		60-33201	BTS-3300	
R69	1Meg 5%		60-10505	BTS-1Meg 5%	
R70	8200Ω 5%		60-82205	BTS-8200 5%	
R71	100K 5%		60-10405	BTS-100K 5%	
R72	82K 5%		60-82305	BTS-82K 5%	
R73	220K		60-22401	BTS-220K	
R74	100K		60-10401	BTS-100K	
R75	330K		60-33401	BTS-330K	
R76	3300Ω		60-33201	BTS-3300	
R77	4.7Meg		60-47501	BTS-4.7Meg	
R78	180K		60-18401	BTS-180K	
R79	3300Ω		60-33201	BTS-3300	
R80	220K		60-22401	BTS-220K	
R81	560K		60-56401	BTS-560K	
R82	4700Ω 5%		60-47205	BTS-4700 5%	
R83	220K		60-22401	BTS-220K	
R84	100K		60-10401	BTS-100K	
R85	3300Ω		60-33201	BTS-3300	
R86	68K 5%		60-68305	BTS-68K 5%	
R87	180K 5%		60-18405	BTS-180K 5%	
R88	22K 5%		60-22305	BTS-22K 5%	
R89	91K 5%		60-91305	BTS-91K 5%	
R90	100K		60-10401	BTS-100K	
R91	330K		60-33401	BTS-330K	
R92	3300Ω		60-33201	BTS-3300	
R93	330K		60-33401	BTS-330K	
R94	1000Ω		60-10201	BTS-1000	
R95	1000Ω		60-10201	BTS-1000	
R96	2200Ω		60-22201	BTS-2200	
R97	2700Ω	5	61-83		
R98	800Ω	5	61-82		
R99	10K		60-10301	BTS-10K	

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS (cont)

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SILVERTONE PART No.	IRC PART No.	
R100	80Ω 5%	10	61-32		
R101	47K	1	60-47311	BTA-47K	
R102	10K		60-10301	BTS-10K	
R103	470Ω		60-47101	BTS-470	
R104	12K		60-12301	BTS-12K	
R105	27K	1	61-72	BTA-27K	Note 3
R106	27K	1	61-72	BTA-27K	Note 3
R107	470K		60-47401	BTS-470K	
R108	470K		60-47401	BTS-470K	
R109	47K	1	61-73	BTA-47K	Note 4
R110	47K	1	61-73	BTA-47K	Note 4
R111	1500Ω		60-15201	BTS-1500	
R112	100K		60-10401	BTS-100K	
R113	100K		60-10401	BTS-100K	
R114	300Ω 5%	10	61-76		
R115	1000Ω 5%	20	61-78	2D-1000 5%	
R116	900Ω 5%	20	61-77		
R117	100Ω 5%	15	61-75	2D-100 5%	
R118	3300Ω 5%	15	61-79		
R119	220K		760036	BTS-220K	
R120	100K		760060	BTS-100K	
R121	4700Ω		760073	BTS-4700	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SILVERTONE PART No.	IRC PART No.	
R122	470K		760037	BTS-470K	
R123	220K		760036	BTS-220K	
R124	4700Ω		760073	BTS-4700	
R125	470K		760037	BTS-470K	
R126	150K		760008	BTS-150K	
R127	100K		760060	BTS-100K	
R128	1500Ω		760003	BTS-1500	
R129	220K		760036	BTS-220K	
R130	220K		760036	BTS-220K	
R131	2200Ω		760068	BTS-2200	
R132	1Meg		760001	BTS-1Meg	
R133	1Meg		760001	BTS-1Meg	
R134	62K 5%		760105	BTS-62K 5%	
R135	100K 5%		760077	BTS-100K 5%	
R136	47K		760013	BTS-47K	
R137	220K		760036	BTS-220K	
R138	470K		760037	BTS-470K	
R139	560Ω	1	760105	BTA-560	
R140	270Ω	1	760115	BTA-270	
R141	470K		760037	BTS-470K	
R142	22K		76005	BTS-22K	
R143	15K		760027	BTS-15K	
R144	1000Ω	10	760401	PW10-1000	

Note 1. Some versions may use 1Meg (Part #60-10502)
Note 2. Some versions may use 470K (Part #60-47401)
Note 3. C105 & C106 are a matched pair.
Note 4. C109 & C110 are a matched pair.

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	SILVERTONE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117 VAC ② 1.4A	780VCT ② .170A	5VAC ② 3A	6.3VAC ② 2.16A	80-407				26R35 ①	
	SEC. 4	SEC. 5	SEC. 6							
	6.3VAC ② 2.1A	6.3VAC ② 1.96A	6.3VAC ② 0A							
T2	117VAC ② .34A	525VCT ② .044A	6.3VAC ② 2.15A		700089	P9203 ② ③④	P-3047④	PM8402 ② ③④	22R01 ② ③⑤	R-8B ② ③④

① Use universal mounting brackets
② Tape 5V winding.
③ Tape center tap on 6.3 winding.
④ Fabricate mounting.
⑤ Use mounting brackets.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	SILVERTONE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T3	7100Ω CT	16Ω Tap② 8Ω	80-408	H4103 ①	A-3101 ①	A-8072 ①	22S65 ①	S-146A	① Fabricate mounting.
T4	4600Ω	3-4Ω	700055	Z1107	A-2930	A-3877	24S51	S-3X	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	SILVERTONE PART No.	QUAM PART No.	
SP1	5"	PM	6-8Ω	013103 ①		① Connect in parallel & phase
SP2	5"	PM	6-8Ω	013103 ①		② Connect in series & phase
SP3	12"	PM	6-8Ω	013180 ②	12A10X ②	
SP4	12"	PM	6-8Ω	013180 ②	12A10X ②	
SP5	5"	PM	3-4Ω	013549	5A07R	

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		SILVERTONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	FM Ant. Coil	10-3-1				
L2	FM RF Coil	10-24-1				
L3	FM Osc. Coil	10-22-4				Includes C9
L4	Loop Stick	013093				* Use full secondary
L5	AM RF Trans.	10-1-1	14-1076 *			
L6	AM Osc. Coil	10-2-4	14-1077		71-Osc.	
L7	1st. FM IF	10-56-2	16-3487	FM-254	1463	
L8	1st. AM IF	10-57-2				
L9	2nd. FM IF	10-56-2	16-3487	FM-254	1463	
L10	2nd. AM IF	10-57-2				
L11	3rd. FM IF	10-55-2	16-3487	FM-254	1463	
L12	3rd. AM IF	10-54-2	16-6758	BC-353	12-C2	
L13	FM Limiter Coil	10-6-5				
L14	FM Discriminator	10-18-0	17-3494	FM-253	1464	
L15	Bias Osc.	700088				Includes C94
L16	52.5KC Trap	700066				

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA					REMARKS
	SILVERTONE PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	MOUNT	
M1	720126	55-T	G-D	56	PT-2	

ASTATIC NEEDLE LISTING SHOWN ABOVE IS SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGE LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	SILVERTONE PART No.	JENSEN PART No.	WALCO PART No.	
M2	720134	† S-61 or †♦ S-61SD or ♦ S-61D	† W-77TPS or †♦ W-77DS or ♦ W-77TPD	† Jewel ♦ Diamond

MISCELLANEOUS

ITEM No.	PART NAME	SILVERTONE PART No.	NOTES
M3	Dial Light	89-7	#47
M4	Dial Light	89-7	#47
M5	Meter Light	89-16	#51
M6	Comp. Light	730061	Record Changer Compartment
M7	Pilot Light	89-7	#47
M8	Meter Light	730016	#47
M9	Tuning Cap	19-1-6	6 Gang (AM section: Ant. 18-515 MMF, RF 35-395 MMF, Osc. 20-160 MMF)
M10	Switch	69-221	Band selector, rotary wafer type
M11	Switch	69-223	Record compensator, rotary wafer type
M12	Switch	740095	Record changer compartment light
M13	Switch	013046	Record-play, slide type
M14	Switch		Mic-tuner, rotary wafer type
M15	Meter	83-1026	Tuning indicator
M16	Meter	700098	Record level
M17	Clock	780006	
	Pointer	58-130	Tone (2 used)
	Pointer	58-129	Dial
	Clock Crystal	490230	
	Dial Scale	490231	
	Knob	310482	Tuning, treble, bass
	Knob	310483	Band selector, loudness, compensator
	Knob	310486	Time set
	Knob	310481	Start, audio time
	Cabinet	440438	Model 7065
	Cabinet	440440	Model 7066
	Legs	440459	Model 7065
	Legs	440460	Model 7066

DIAL CORD STRINGING

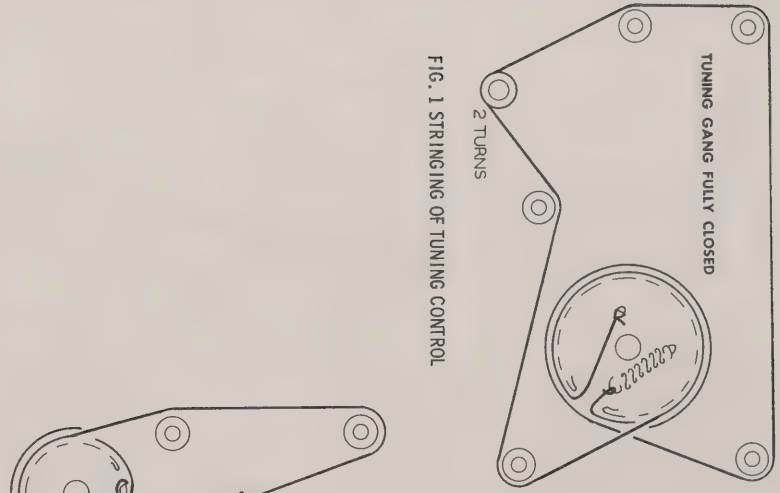


FIG. 1 STRINGING OF TUNING CONTROL

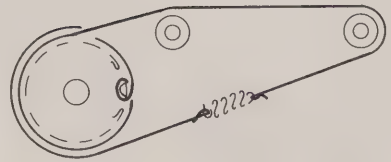
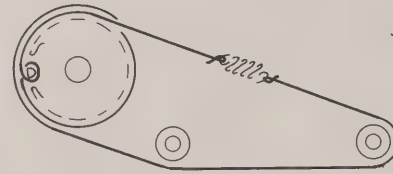


FIG. 3 STRINGING OF BASS & TREBLE POINTERS



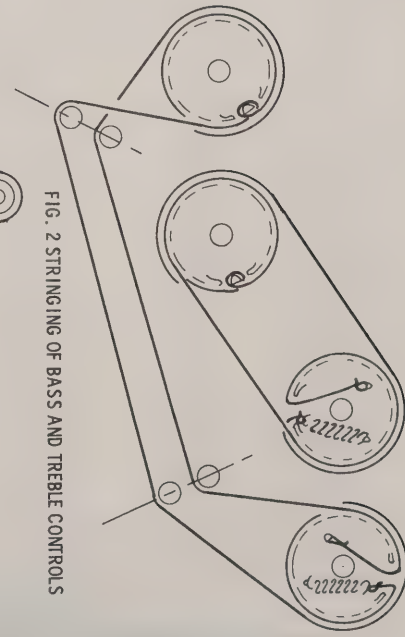


FIG. 2 STRINGING OF BASS AND TREBLE CONTROLS

PROPERTY OF
L. F. BLANKENSHIP
2024 MEADE ST.
DENVER, COLORADO

SONORA
MODELS 541, 630, 631, 632

SONORA
MODELS 541, 630, 631, 632

TRADE NAME	Sonora Models 541, 630, 631, 632
MANUFACTURER	Sonora Radio & Tel. Corp., 325 N. Hoyne Ave., Chicago, Ill.
TYPE SET	AC-DC Operated AM Receiver
TUBES (Four)	Types 12AU6 Converter, 12AV6 Det.-AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-DC
RATING	.27 Amp. @ 117 Volts AC (26 Watts)
TUNING RANGE—BROADCAST	535-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.05MFD	High Side to Ant. stator Lug on Tuning Gang Low Side to B-.	455KC (400%Mod.)	Tuning Gang Fully Open	Across Voice Coil	A1, A2	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2	"	"	1620 KC	"	"	A3	"
3		Loop	1400 KC	Tune to 1400KC Signal	"	A4	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Converter	12AU6	
V2	Det. -AF Amp.	12AV6	

ITEM No.	USE	TYPE	NOTES
V3	Output	50C5	
V4	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	SONORA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	40	150	R-1482	PRS150/25V 4020/20	BBRT4215C	TCT3114	TDLT-12	FMT-321	TVA-3423
B	20	150							
C	20	15							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	SONORA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	100		N-6015	SI 100	D6-101	LT6T1	GP-100	UC-531	5GA-T1	
C3	56			SI 56	D6-560	LT6Q56	GP-56	UC-5456	5GA-Q56	
C4	56			SI 56	D6-560	LT6Q56	GP-56	UC-5456	5GA-Q56	
C5	10000		N-9062	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C6	.047	200	R-1462	BPD-05	DF-503	CUB2S47		GEM-4147	2TM-S47	
C7	.02	400	N-1461	BPD-02	DD-203	CUB4S2	ED-02	GEM-412	4TM-S2	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	SONORA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	2Meg	½	R-1455	B-76	A47-2Meg-Z	Q13-139	U55	Volume
B	Shaft			Not req.	KSS-3	Not req.	Not req.	
C	Switch			KB-1	SWE-12	76-1	US-26	

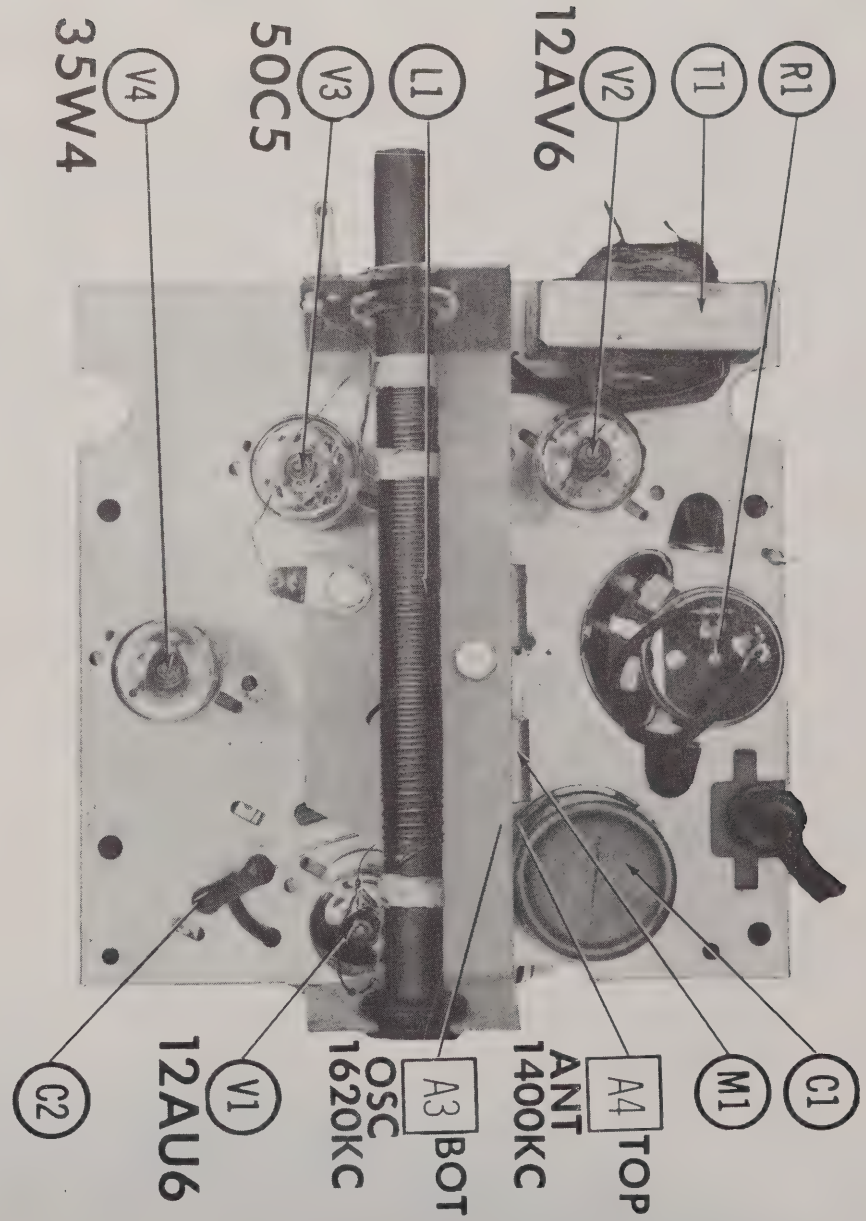
RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SONORA PART No.	IRC PART No.	
R2	2. 7Meg		N-8027	BTS-2. 7Meg	
R3	180Ω		N-4067	BTS-180	
R4	2200Ω		N-4896	BTS-2200	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SONORA PART No.	IRC PART No.	
R5	22Ω		N-5889	BTS-22	
R6	68Ω	2	R-1483		

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	SONORA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	3400Ω	3-4Ω	R-1480	Z1101 ①	A-3025 ①	A-3332 ①	26S58 ②	S-12X①	① Bend Ears Down. ② Use Original Channel Mounting Frame.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	SONORA PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	R-1478	4A07	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		SONORA PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Stick	R-1811				
L2	Osc. Coil	R-1486				
L3	IF Trans.	R-1484				

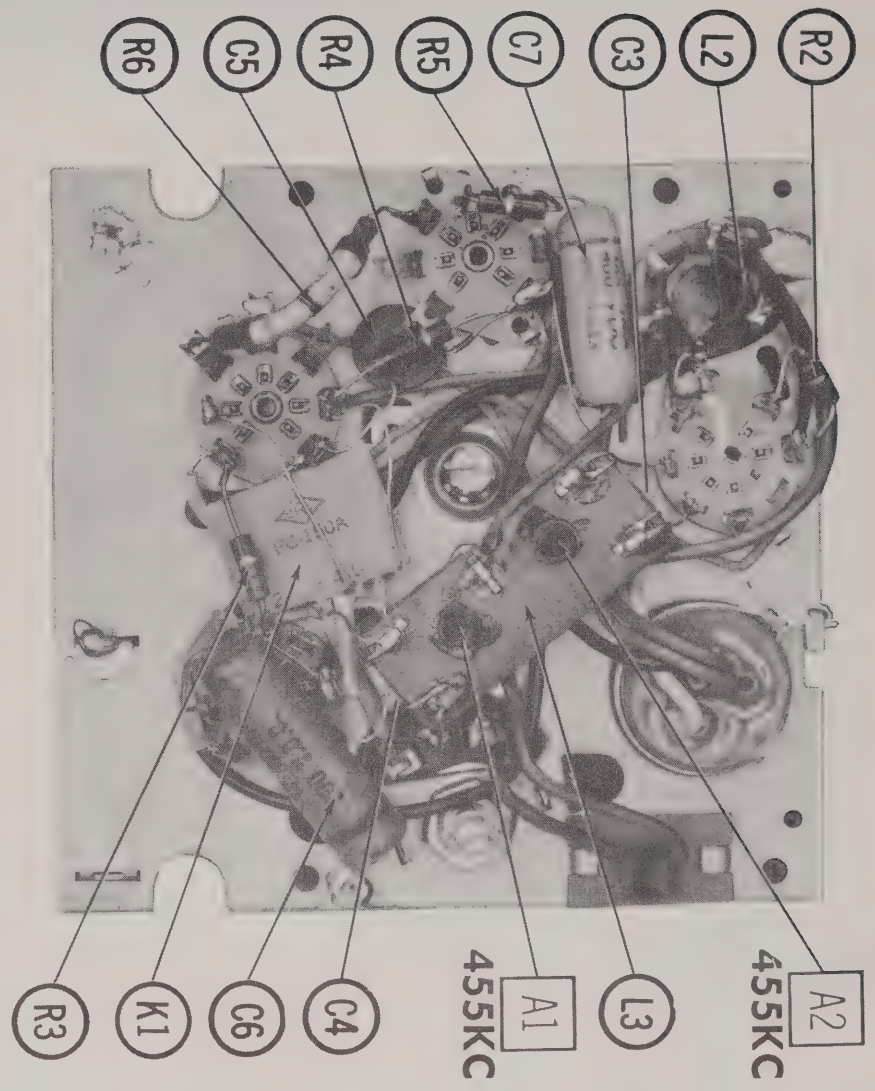
COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	SONORA PART No.	REPLACEMENT DATA	
K1	Det. -Audio Net.	5000MMF 2000MMF 250 MMF 220MMF 6. 8Meg, 470K, 470K	R-1487	Aerovox Centralab Cornell-Dubilier Erie Sprague	PA-113-1 PC-150A 116TM1 1408-01 DT-5

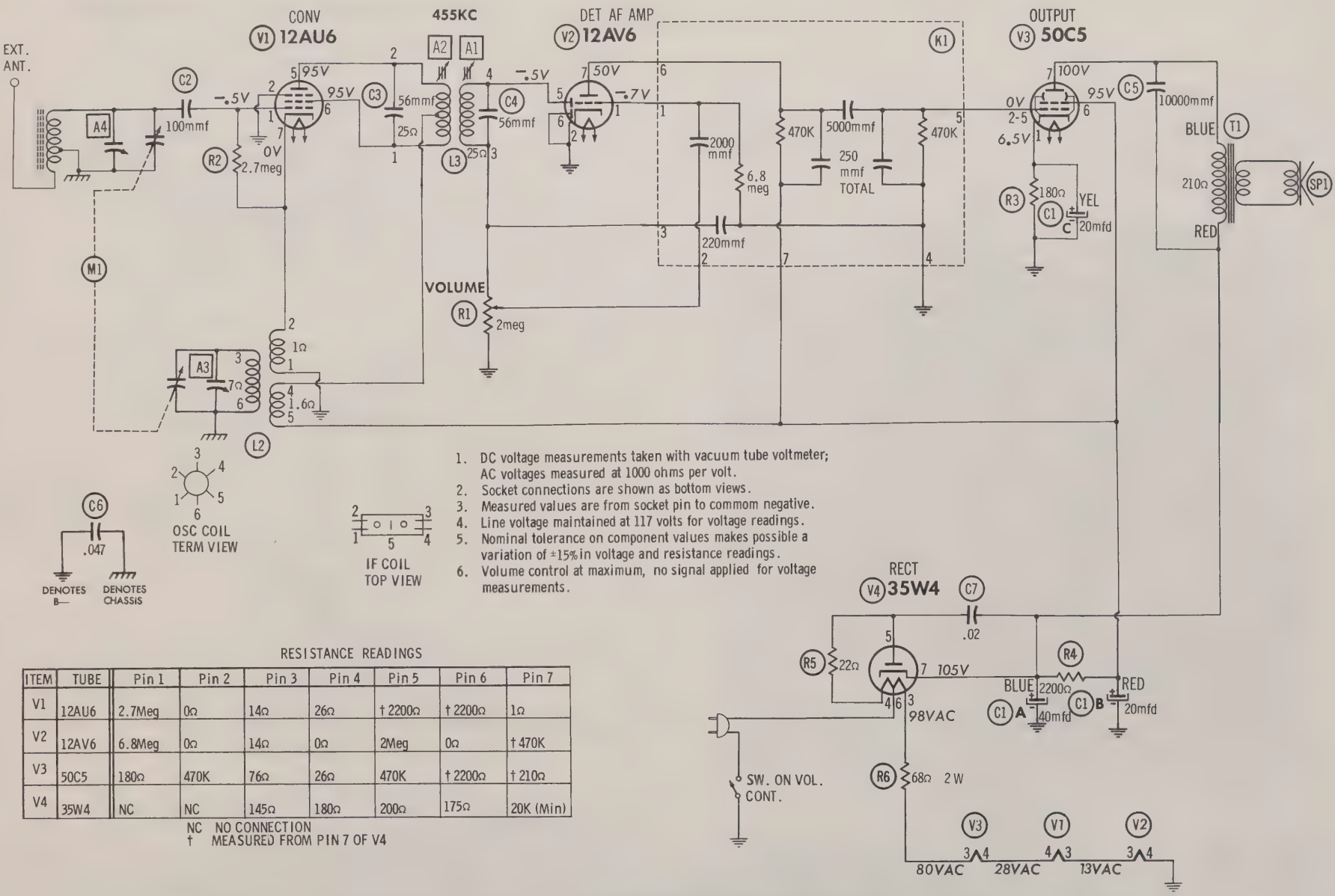
MISCELLANEOUS

ITEM No.	PART NAME	SONORA PART No.	NOTES
M1	Tuning Cap	R-1481	Two Gang (21-290MMF, 12-115MMF)

CHASSIS—BOTTOM VIEW



SONORA MODEL 541



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to commom negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12AU6	2.7Meg	0Ω	14Ω	26Ω	† 2200Ω	† 2200Ω	1Ω
V2	12AV6	6.8Meg	0Ω	14Ω	0Ω	2Meg	0Ω	† 470K
V3	50C5	180Ω	470K	76Ω	26Ω	470K	† 2200Ω	† 210Ω
V4	35W4	NC	NC	145Ω	180Ω	200Ω	175Ω	20K (Min)

NC NO CONNECTION
† MEASURED FROM PIN 7 OF V4

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

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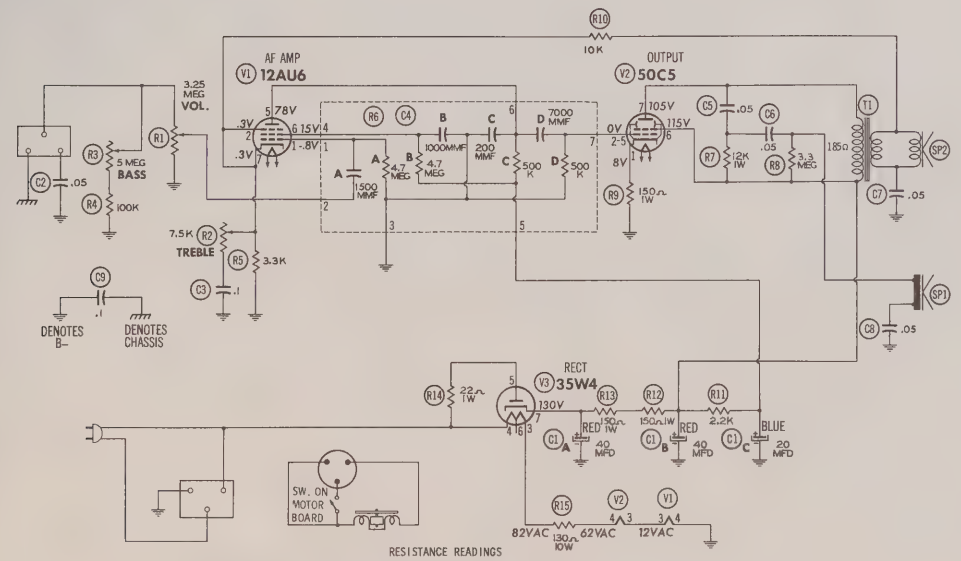
PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

STEELMAN MODELS
3A15, 3A16, 3A17

TRADE NAME	Steelman Models 3A15, 3A16, 3A17
MANUFACTURER	Steelman Phono & Radio Co., Inc., 12-30 Anderson Ave., Mt. Vernon, N. Y.
TYPE SET	AC Operated Phono Amplifier With 3 Speed Automatic Record Changer
TUBES (Three)	Types 12AU6 AF Amplifier, 50C5 Output, 35W4 Rectifier
POWER SUPPLY	105-120 Volts AC - 60 Cycles RATING .23 Amp. @ 117 Volts AC

FOR SERVICE INFORMATION ON RECORD CHANGER - SEE SIMILAR V-M MODEL 954B - PHOTOFACT SET 302 - FOLDER 12.



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12AU6	4.7Meg	2600Ω	12Ω	0Ω	†500K	†4.7Meg	2600Ω
V2	50C5	150Ω	500K	12Ω	62Ω	500K	†300Ω	†485Ω
V3	35W4	TP	TP	190Ω	225Ω	250Ω	220Ω	50K

ALL MEASUREMENTS TAKEN WITH PHONO MOTOR DISCONNECTED.
† MEASURED FROM PIN 7 OF V3.
TP TIE POINT

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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	AF Amplifier	12AU6	
V2	Output	50C5	
V3	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA STEELMAN PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	40	150		PRS150V4040	BBRT44215	TCT3116	TDLT-4	FMT-315	TVA-3448
B	40	150		20					
C	20	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA STEELMAN PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C2	.05	200		BPD-05	DF-503	CUB2S5		PT415	2TM-S5	
C3	.1	200		P288N-1	DF-104	CUB2P1		PT401	2TM-P1	
C4A	1500				DD-152	K071	ED-0015	DC5215	5HK-D15	
B	1000		♦	♦PA443	DD-102	K069	ED-001	DC521	5HK-D1	
C	200				D6-201	G050	ED-0002	UC-532	5GA-T2	
D	7000				D6-682	K081	ED-0068		5HK-D68	
C5	.05	200		BPD-05	DF-503	CUB2S5		PT415	2TM-S5	
C6	.05	200		BPD-05	DF-503	CUB2S5		PT415	2TM-S5	
C7	.05	200		BPD-05	DF-503	CUB2S5		PT415	2TM-S5	
C8	.05	200		BPD-05	DF-503	CUB2S5		PT415	2TM-S5	
C9	.1	200		P288N-1	DF-104	CUB2P1		PT401	2TM-P1	

♦ Items C4A, C4B, C4C, C4D, R6A, R6B, R6C and R6C are combined in one unit.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA STEELMAN PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	3.25Meg	½	VC-76	AB-85	A47-4Meg-Z	Q13-140	U-57	Volume
B	Shaft			AK-4	KSS-3	Not Req.	Not Req.	
R2A	7500Ω	½	VC-75	AB-13	A47-7500-S	Q11-115	U-20	Treble
B	Shaft			AK-4	KSS-3	Not Req.	Not Req.	
R3A	5Meg	½	VC-101	AB-87	A47-5Meg-S	Q11-141	U-67	Bass
B	Shaft			AK-4	KSS-3	Not Req.	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA STEELMAN PART No.	IRC PART No.	NOTES
R4	100K			BTS-100K	
R5	3300Ω			BTS-3300	
R6A	4.7Meg			BTS-4.7Meg	
B	4.7Meg		♦	BTS-4.7Meg	
C	500K			BTS-470K	
D	500K			BTS-470K	
R7	12K	1		BTA-12K	
R8	3.3Meg			BTS-3.3Meg	

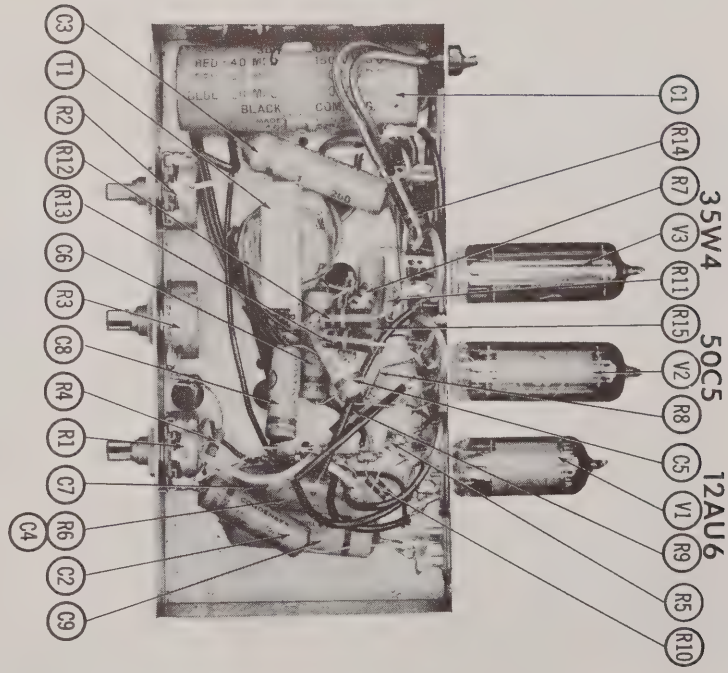
ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA STEELMAN PART No.	IRC PART No.	NOTES
R9	150Ω	1		BTA-150	
R10	10K			BTS-10K	
R11	2200Ω			BTS-2200	
R12	150Ω	1		BTA-150	
R13	150Ω	1		BTA-150	
R14	22Ω	1		BTA-22	
R15	130Ω	10		1 3/4A-125	

♦ Items R6A, R6B, R6C, R6D, C4A, C4B, C4C and C4D are combined in one unit.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA STEELMAN PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	2650Ω	3-4Ω	TR-120	Z1101	A-3025	A-3332	22S45 ①	S-12X	① Drill new mtg. hole.

CHASSIS—BOTTOM VIEW



SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA STEELMAN PART No.	REPLACEMENT DATA QUAM PART No.	NOTES
SP1 SP2	8"	PM	3-4Ω	SP-104	8A21	Electrostatic Speaker.

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA STEELMAN PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. MOUNT	REMARKS
M1		420-TS	N8-1 and N8-3			

ASTATIC NEEDLE LISTING SHOWN ABOVE IS SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGE LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA STEELMAN PART No.	JENSEN PART No.	WALCO PART No.	REMARKS
M2		†CR-55 or ♦CR-55D and †CR-55LP or ♦CR-55LPD	†W-64S or ♦W-64D and †W-64MGS or ♦W-64MGD	† Jewel ♦ Diamond

RETMA MEMBER
RADIO-ELECTRONIC-TELEVISION MANUFACTURERS ASSOCIATION

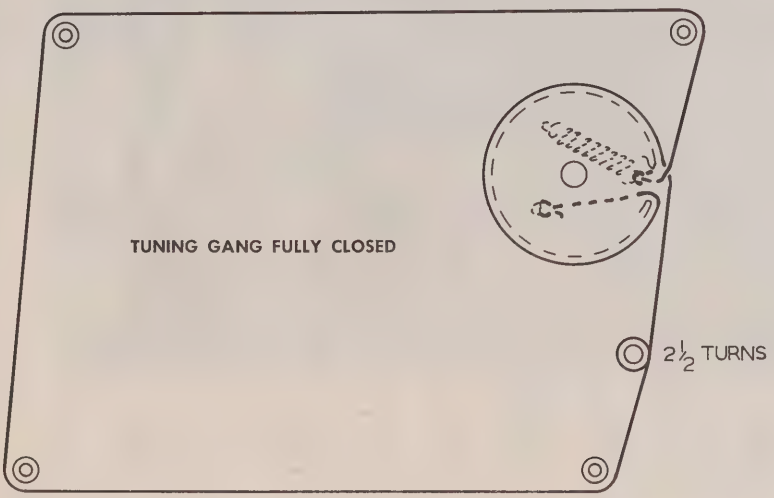
STROMBERG-CARLSON MODEL SR-407

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

STROMBERG-CARLSON
MODEL SR-407

STROMBERG-CARLSON
MODEL SR-407

TRADE NAME	Stromberg-Carlson Model SR-407		
MANUFACTURER	Stromberg-Carlson Co., Service Dept., 1700 University Ave., Rochester 10, N.Y.		
TYPE SET	AC Operated FM-AM Receiver		
TUBES	Twelve		
POWER SUPPLY	110-120 Volts AC-60 Cycles	RATING	.88 Amp. @ 117 Volts AC (95 Watts)
TUNING RANGE-BROADCAST	540KC-1620KC	FREQ. MOD.	88MC-108MC



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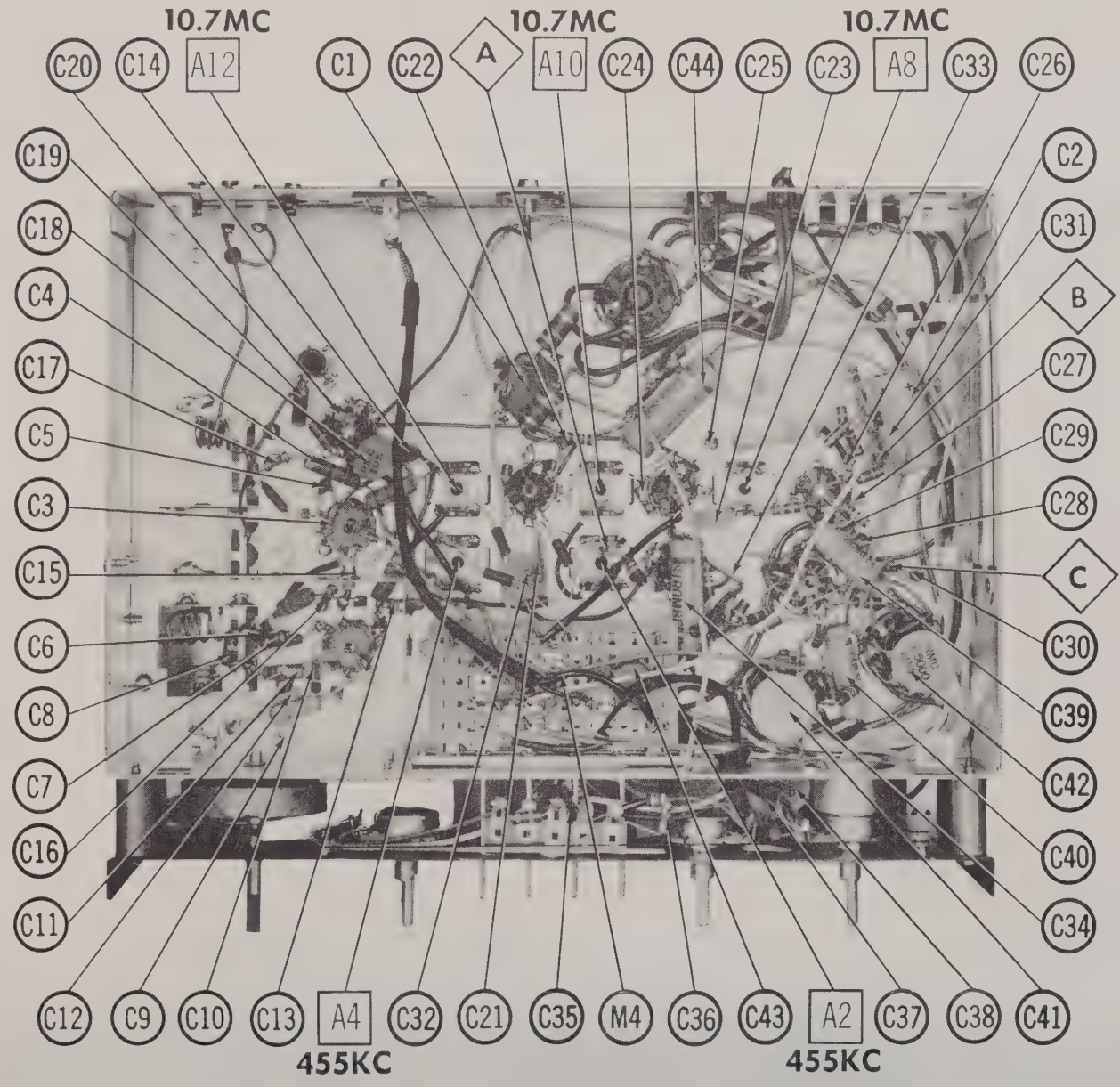
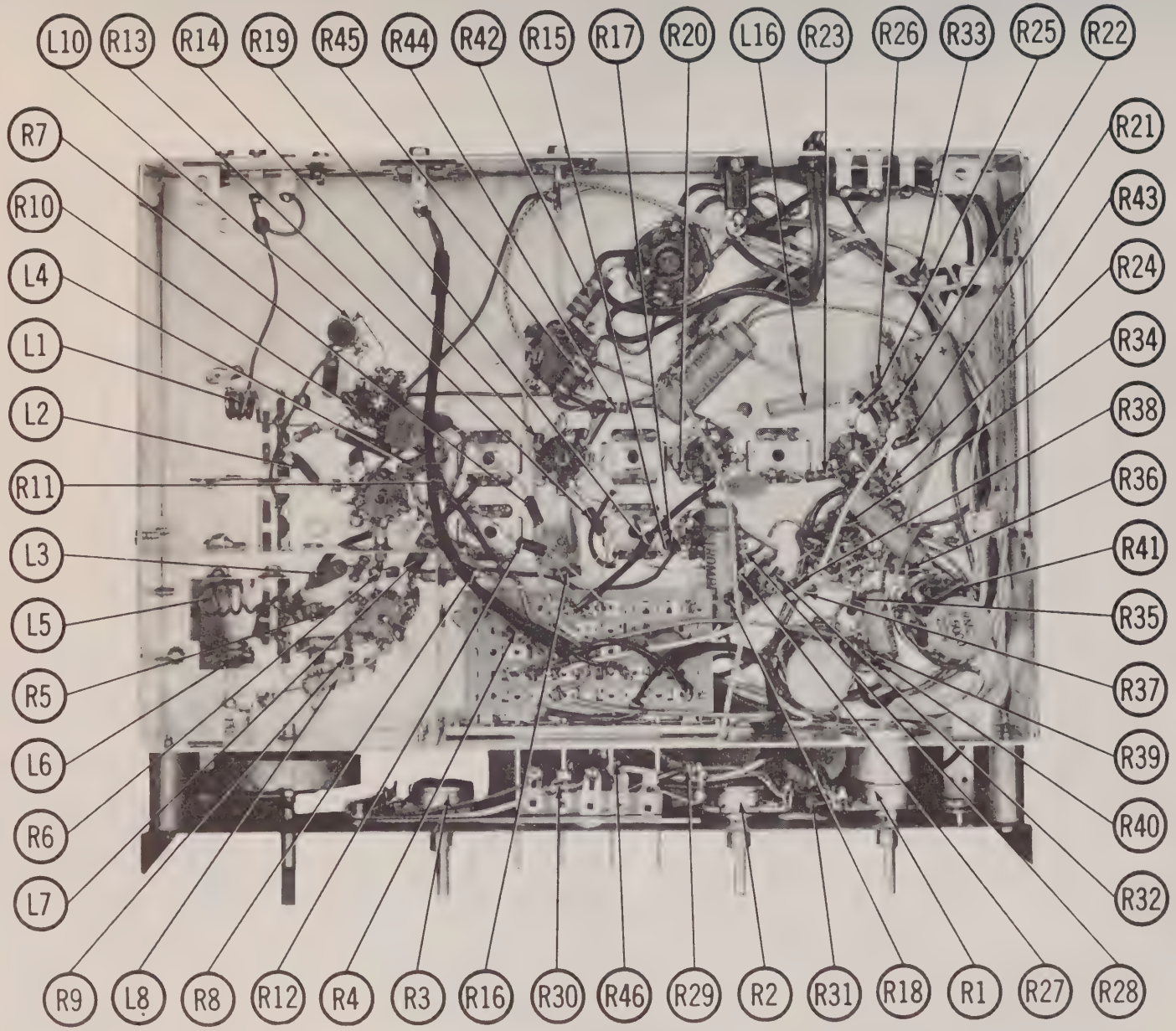


CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

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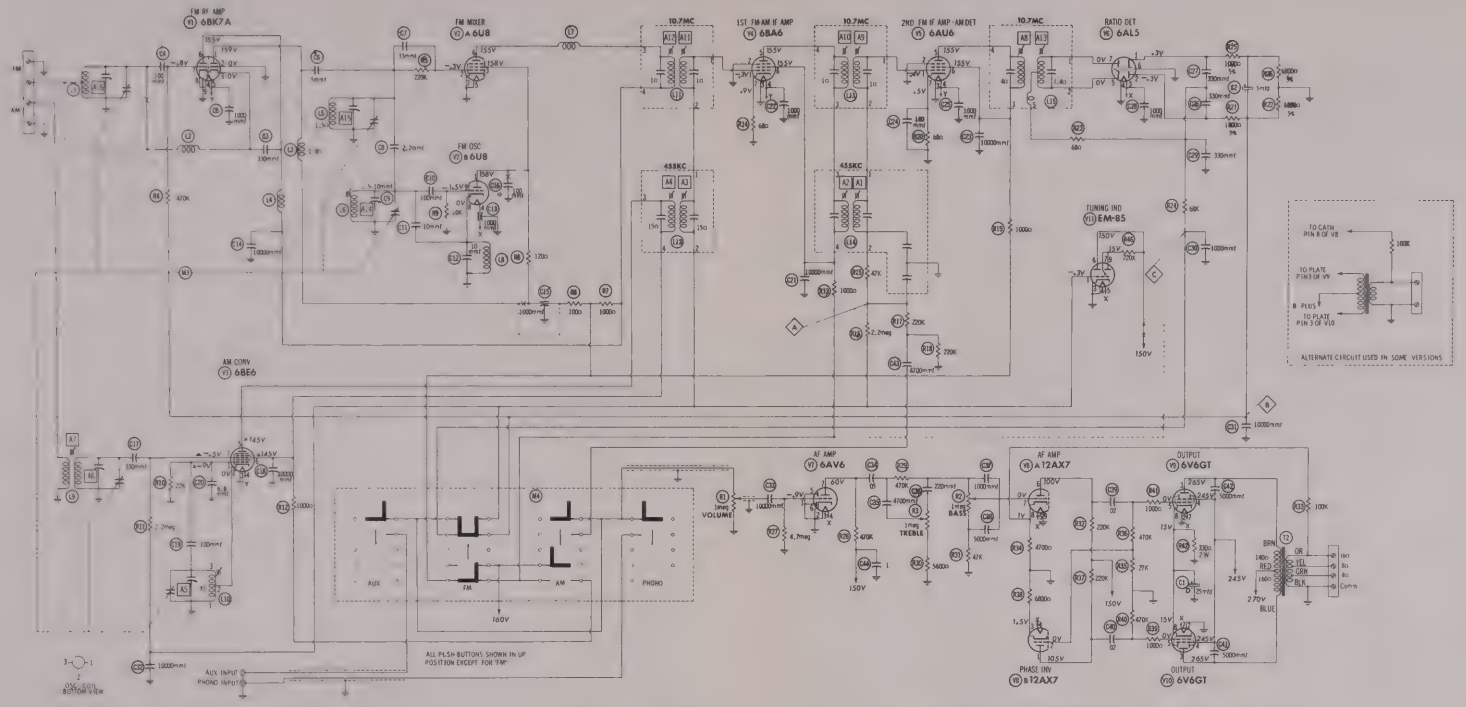
STROMBERG-CARLSON
MODEL SR-407



DC COPY RESISTANCE VALUES UNDER OHM NOT SHOWN ON SCHEMATIC

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt
2. Socket connections are shown as bottom views
3. Measured values are from socket pin to common negative
4. Line voltage maintained at 117 volts for voltage readings
5. Nominal tolerance on component values makes possible a variation of ±10% in voltage and resistance readings
6. Volume control at maximum, no signal applied for voltage measurements

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	P. n 9
V1	6BK7A	†360Ω	0Ω	4Ω	0Ω	.6Ω	†450Ω	475K	0Ω	0Ω
V2	6U8	†360Ω	220K	†360Ω	.6Ω	0Ω	†450Ω	0Ω	.4Ω	10K
V3	6BE6	+22K	.6Ω	0Ω	.6Ω	†450Ω	†450Ω	4.8Meg		
V4	6BA6	680Ω	0Ω	0Ω	.6Ω	†450Ω	†450Ω	68Ω		
V5	6AU6	490K	0Ω	0Ω	.6Ω	†450Ω	†450Ω	68Ω		
V6	6AL5	8000Ω	8000Ω	.6Ω	0Ω	75K	0Ω	75K		
V7	6AV6	4.7Meg	0Ω	0Ω	0Ω	0Ω	0Ω	1510K		
V8	12AX7	†260K	77K	6800Ω	.6Ω	.6Ω	†260K	47K	4700Ω	0Ω
V9	6V6GT	NC	0Ω	†140Ω	†4700Ω	500K	TP	.6Ω	330Ω	
V10	6V6GT	NC	0Ω	†160Ω	†4700Ω	470K	TP	.6Ω	330Ω	
V11	EM-85	6800Ω	NC	0Ω	0Ω	.6Ω	1.3K	†260K	NC	†260K
V12	5Y3GT	NC	250K MIN	NC	130Ω	NC	130Ω	NC	250K MIN	

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED
† MEASURED FROM PIN 8 OF V12
• MEASURED IN "AM" POSITION
NC NO CONNECTION
TP TIE POINT

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362-12

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
With tuning gang fully closed, adjust dial pointer to coincide with "0" on the logging scale.

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1	.1MFD	High side to pin 7 (grid) of 6BE6(V3). Low side to chassis.	455KC (400∿ Mod.)	AM	Point of non-interference (Low end of dial).	DC probe to point Ⓐ. Common to chassis.	A1, A2, A3, A4	Adjust for maximum deflection.
2		Loop	1600KC	"	1600KC	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3		"	1400KC	"	1400KC	"	A6	"
4		"	600KC	"	600KC	"	A7	Adjust antenna coil (located on loop stick) for maximum deflection. Repeat step 4 & 5 until proper tracking is obtained.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

AFC in "OFF" position.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
5	.1MFD	High side to pin 2 (grid) of 6U8 (V2). Low side to chassis	10.7MC (unmod.)	FM	100MC	DC probe to point Ⓑ. Common to chassis.	A8, A9, A10, A11, A12	Adjust for maximum deflection.
6	"	"	"	"	"	DC probe to point Ⓒ. Common to chassis.	A13	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
5	.1MFD	High side to pin 2 (grid) of 6U8 (V2). Low side to chassis.	10.7MC (450KC Swp.)	FM	100MC	Vert amp. to point Ⓑ. Low side to chassis.	A8, A9, A10, A11, A12	Disconnect stabilizing capacitor C2. Adjust for curve of maximum amplitude and symmetry similar to Fig. 1
6	"	"	"	"	"	Vert amp. to point Ⓒ. Low side to chassis.	A13	Reconnect stabilizing capacitor C2. Adjust so that 10.7MC occurs at center of crossover lines similar to Fig. 2. SLIGHTLY retouch A8 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
7	270Ω Carbon Resistor	High side thru dummy to FM Ant. terminal. Low side to chassis.	100MC (unmod.)	FM	100MC	Dprobe to point Ⓒ. Common to chassis.	A14, A15, A16	Adjust for maximum deflection.
8	"	"	"	"	"	"	L1, L5, L6	Using 100 MC as a reference, check dial calibrations and sensitivity at 88, 90, 106 and 108MC. If this check shows excessive variation compress or expand L1, L5 and L6. Repeat step 7 and 8 until proper tracking has been obtained.

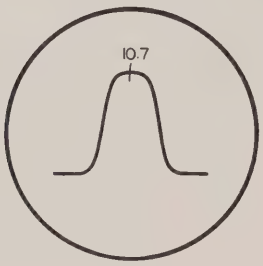


FIG. 1

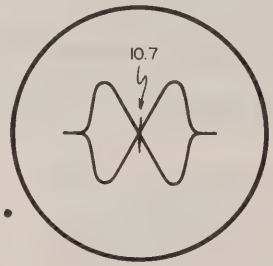


FIG. 2

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	FM RF Amplifier	6BK7A	
V2	FM Mixer-Osc.	6U8	
V3	AM Converter	6BE6	
V4	1st. IF Amplifier	6BA6	
V5	2nd. FM IF Amp. -AM Det. - AVC	6AU6	
V6	Ratio Detector	6AL5	
V7	AF Amplifier	6AV6	
V8	AF Amp. - Phase Inverter	12AX7	
V9	Output	6V6-GT	
V10	Output	6V6-GT	
V11	Tuning Indicator	EM-85	
V12	Rectifier	5Y3GT	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA Stromberg-Carlson PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲20	450	111090-000	AFH4-26	D0624	FP430.2	TMQ-90	Q-370	R2404 *
B	■20	450			BBR5-50		TD-5-25		
C	▲40	350							
D	25	25							
C2	5	50		PRS50V5	BBR5-50	TC30	TD-5-50	MMT-0505	TVA-1303

* Non catalog item

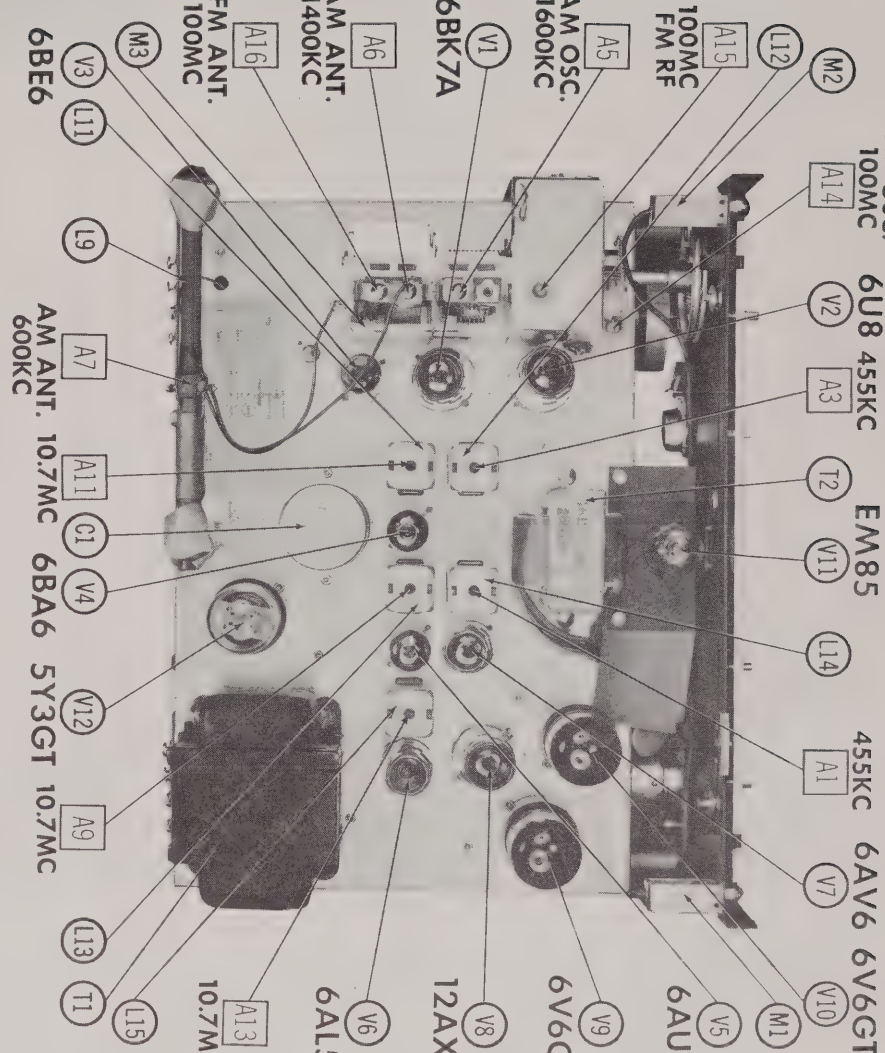
FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA Stromberg-Carlson PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C3	330			SI 330	D6-331	LT6T33	GP-330	UC-5333	5GA-T33	
C4	100			SI 100	D6-101	LT6T1	GP-100	UC-531	5GA-T1	
C5	1000			BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	
C6	5			SI 5	D6-050	LT6V5	GP-5	ZT-555	5GA-V5	
C7	33			SI 33	D6-330	LT6Q33	GP-33	UC-5433	5GA-Q33	
C8	2.2			NP0-SI 2.2	TCZ-2R2	C10V22C	TCO-2.2		5TCCB-V22	
C9	1.5-10		110853-000		829-10					
C10	100			SI 100	DD-101	LT6T1	GP-100	UC-531	5GA-T1	
C11	10			N750-SI 10	TCN-10	CTA6QIU	TC7-10	NT-541	5TCCB-Q1	N750
C12	10			N750-SI 10	TCN-10	CTA6QIU	TC7-10	NT-541	5TCCB-Q1	N750
C13	1000		110893-000	EF-001	MFT-1000				503C-D1	
C14	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C15	1000		110893-000	EF-001	MFT-1000				503C-D1	
C16	100			SI 100	D6-101	LT6T1	GP-100	UC-531	5GA-T1	Note 1
C17	330			SI 330	D6-331	LT6T33	GP-330	UC-5333	5GA-T33	
C18	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C19	100			SI 100	D6-101	LT6T1	GP-100	UC-531	5GA-T1	
C20	6.8									N450
C21	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C22	1000			BPD-001	DD-102	BYA6D1	ED-1000	DC525	5HK-D1	
C23	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C24	100			SI 100	D6-101	LT6T1	GP-100	UC-531	5GA-T1	
C25	1000			BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	
C26	330			SI 330	D6-331	LT6T33	GP-330	UC-5333	5GA-T33	
C27	330			SI 330	D6-331	LT6T33	GP-330	UC-5333	5GA-T33	
C28	1000			BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	
C29	330			SI 330	D6-331	LT6T33	GP-330	UC-5333	5GA-T33	
C30	1000			BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	
C31	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C32	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C33	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C34	.05	400		BPD-05	DF-503	CUB4S5		GEM-415	4TM-S5	
C35	4700			BPD-0047	DD-472	BYA10D47	ED-0047	UC-5247	5GA-D47	
C36	220			SI 220	D6-221	LT6T22	GP-220	UC-5322	5GA-T22	
C37	1000			BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	
C38	5000			BPD-005	DD-502	BYA10D5	ED-005	DC5[illegible]	5HK-D5	
C39	.02	400		BPD-02	DD-203	CUB4S2	ED-02	GEM-412	4TM-S2	
C40	.02	400		BPD-02	DD-203	CUB4S2	ED-02	GEM-412	4TM-S2	
C41	5000			BPD-005	DD-502	BYA6D5	ED-005	DC525	5HK-D5	
C42	5000			BPD-005	DD-502	BYA6D5	ED-005	DC525	5HK-D5	
C43	4700			BPD-0047	DD-472	BYA10D47	ED-0047	UC-5247	5GA-D47	
C44	.1	400		P488N-1	DF-104	CUB4P1		GEM-401	4TM-P1	

Note 1. Not used in some versions

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Stromberg-Carlson PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	1Meg	½	145206-000	B-70	A47-1Meg-Z	Q13-137	U53	Volume
B	Shaft			Not req.	FS-3	Not req.	Not req.	
C	Switch			KB-1	SWE-12	76-1	US-26	
R2A	1Meg	½	145208-000	B-70	A47-1Meg-Z	Q13-137	U53	Bass
B	Shaft			Not req.	FS-3	Not req.	Not req.	
R3A	1 Meg	½	145207-000	B-70	A47-1Meg-A	Q13-137	U53	Treble
B	Shaft			Not req.	FS-3	Not req.	Not req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Stromberg-Carlson PART No.	IRC PART No.	
R4	470K			BTS-470K	
R5	220K			BTS-220K	
R6	120Ω			BTS-120	
R7	1000Ω			BTS-1000	
R8	100Ω			BTS-100	
R9	10K			BTS-10K	
R10	22K			BTS-22K	
R11	2.2Meg			BTS-2.2Meg	
R12	1000Ω			BTS-1000	
R13	1000Ω			BTS-1000	
R14	68Ω			BTS-68	
R15	47K			BTS-47K	
R16	2.2Meg			BTS-2.2Meg	
R17	220K			BTS-220K	
R18	220K			BTS-220K	
R19	1000Ω			BTS-1000	
R20	68Ω			BTS-68Ω	
R21	1800Ω 5%			BTS-1800 5%	
R22	6800Ω 5%			BTS-6800 5%	
R23	68Ω			BTS-68	
R24	68K			BTS-68K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Stromberg-Carlson PART No.	IRC PART No.	
R25	1000Ω 5%			BTS-1000 5%	
R26	6800Ω 5%			BTS-6800 5%	
R27	4.7Meg			BTS-4.7Meg	
R28	470K			BTS-470K	
R29	470K			BTS-470K	
R30	5600Ω			BTS-5600	
R31	47K			BTS-47K	
R32	220K			BTS-220K	
R33	100K			BTS-100K	
R34	4700Ω			BTS-4700	
R35	27K			BTS-27K	
R36	470K			BTS-470K	
R37	220K			BTS-220K	
R38	6800Ω			BTS-6800	
R39	1000Ω			BTS-1000	
R40	470K			BTS-470K	
R41	1000Ω			BTS-1000	
R42	330Ω	2		BTB-330	
R43	3500Ω	15	149541-000	2D-3500	
R44	39K			BTS-39K	
R45	4700Ω	2		BTB-4700	
R46	220K			BTS-220K	

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	Stromberg-Carlson PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117 VAC ② .88A	620 VCT ② .110A	5VAC ② 2A	6.3VAC ② 4.1A	161456-000	P9312 ① ②		PC8422 ① ②	22R05 ① ③	R-14A ① ②

① Tape center tap on 6.3V winding.
② Fabricate mounting.
③ Use universal mounting brackets and fabricate mounting.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	Stromberg-Carlson PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	8000Ω CT	16Ω Taps ② 8Ω, 4Ω	161296-000	Z1404	A-3027 ①		26S59 ①	S-28X ①	① Drill new mounting hole.

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		Stromberg-Carlson PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	FM Ant. Coil	114191-000				
L2	Neutr. Coil	114193-000	19-1002	BC-563	4606	2.2 Microhenries
L3	RF Choke	114693-000	19-1002	BC-563	4606	2.2 Microhenries (IRC part #CLA)
L4	RF Choke	114693-000	19-1002	BC-563	4606	2.2 Microhenries (IRC part #CLA)
L5	FM RF Coil	114191-000				
L6	FM Osc. Coil	114190-000				
L7	RF Choke	114693-000	19-1002	BC-563	4606	2.2 Microhenries (IRC part #CLA)
L8	Cathode Choke	114729-000		BC-560	4588	.47 Microhenry (IRC part #CLA)
L9	Loop Stick	139074-000				
L10	AM Osc. Coil	114188-000	14-1055			
L11	1st. FM IF	114363-000	16-3487	FM-254	1463	
L12	1st. AM IF	114364-000	16-6758	BC-352	12-C1	
L13	2nd. FM IF	114363-000	16-3487	FM-254	1463	
L14	2nd. AM IF	114453-000	16-6770	BC-355	12-C6	
L15	Ratio Det.	114485-000	17-3498	FM-255	1465	
L16	Fil. Choke	114707-000		BC-560	4588	.47 Microhenry (IRC part #CLA)

MISCELLANEOUS

ITEM No.	PART NAME	Stromberg-Carlson PART No.	NOTES
M1	Dial Light		#47
M2	Dial Light		#47
M3	Tuning Cap	110064-000	5 Gang (AM sections: 33-405 MMF Ant., 20-140 MMF Osc.)
M4	Switch	158062-000	Function Selector, Slide Type
	Dial Glass	122061-000	
	Bezel	125634-000	Dial
	Pointer	144603-000	Dial
	Antenna	139600-000	FM Dipole Ass'y
	Push-button	107020-000	4 Used
	Knob	134302-000	On-Off-Volume, Tuning
	Knob	134310-000	Treble, Bass

RETMA MEMBER

TRUETONE MODEL D3716A

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

TRUETONE MODEL D3716A

TRUETONE MODEL D3716A

TRADE NAME	Truetone Model D3716A
SUPPLIER	Western Auto Supply Co., 2107 Grand Ave., Kansas City, Mo.
TYPE SET	Battery Operated Portable Transistorized AM Receiver

POWER SUPPLY 6 Volts DC RATING 6.5 MA@6 Volts DC
TUNING RANGE—BROADCAST 540KC-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1		Across secondary winding of antenna	455 KC (400%Mod.)	Tuning gang fully open	Across voice coil	A1, A2	Adjust for maximum output
2		"	"	Slowly cover entire tuning range.	"	A3	Adjust so that oscillation (if any) throughout tuning range is eliminated.
	NOTE: IF oscillation (if any) will be heard as distortion ranging from "motor boating" to a howl. Some SLIGHT adjusting of A1 or A2 may be necessary to obtain neutralization over the entire tuning range.						
3		Loop	1620 KC	Tuning gang fully open	Across voice coil	A4	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
4		"	1400 KC	1400 KC	"	A5	"
5		"	535 KC	Tuning gang fully closed	"	A6	"

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PARTS LIST AND DESCRIPTIONS

TRUETONE MODEL D3716A

TRANSISTORS

ITEM No.	USE	TRUETONE PART No.	NOTES
X1	Converter	112-001	
X2	IF Amplifier	112-002	
X3	Driver	112-004	
X4	Output	112-003	Note 1.
X5	Output	112-003	Note 1.

Note 1. X4 & X5 are a matched pair

TRANSISTOR REPLACEMENT CHART

TRUETONE TYPE	GENERAL TRANSISTOR TYPE	GENERAL ELECTRIC TYPE	RAYTHEON TYPE	RCA TYPE	TEXAS INST. TYPE
112-001	GT766	2N136		2N140	
112-002	GT760	2N135	CK760, 2N112, CK766	2N139	
112-003	GT2N109	2N186	CK888	2N109	2N109, 352
112-004	GT81, 2N109	2N191	CK888	2N109	310

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	TRUETONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	100	6	45-439	SRE6V100	NL100-6	TT6X100			TE-1102
C2	10	2	45-438	XPP6V10	NL10-3	TT3X10	ML10-6	MMT-0210	TE-1053
C3	3	2	45-437	XPP6V3	NL3-6	TAW8A3	ML4-6	MMT-605	TE-1082
C4	30	2	45-436	XPP6V30	NL30-6	TT6X30	ML30-6	MMT-325	TE-1092

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	TRUETONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C5	10000		47A354	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C6	350		C-8N1-274							5%
C7	4-40		44-471							
C8	350		C-8N1-274							5%
C9	.047	100	46C618-473M1	BPD-05	DF-503	CUB2S47		GEM-4147	2TM-S47	
C10	.047	100	46C618-473M1	BPD-05	DF-503	CUB2S47		GEM-4147	2TM-S47	
C11	.047	100	46C618-473M1	BPD-05	DF-503	CUB2S47		GEM-4147	2TM-S47	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	TRUETONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	10K	1/2	25B1405	B-15	A47-10K-Z	Q13-116	U18	Volume
B	Shaft			Not req.	KSS-3	Not req.	Not req.	
C	Switch			KB-1	SWE-12	76-1	US-26	

RESISTORS

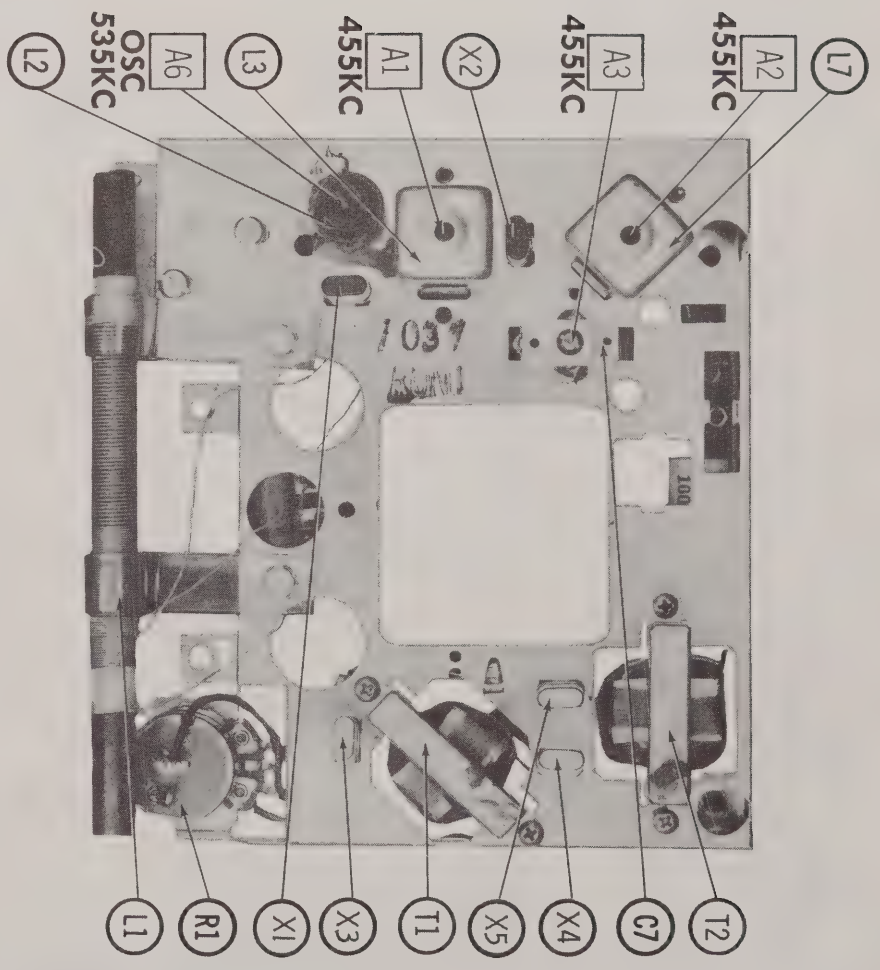
All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	TRUETONE PART No.	IRC PART No.	
R2	6800Ω		23X20X682K	BTS-6800	
R3	12K		23X20X123K	BTS-12K	
R4	100K		23X20X104K	BTS-100K	
R5	470Ω		23X20X471K	BTS-470	
R6	8200Ω		23X20X822K	BTS-8200	
R7	68K		23X20X683K	BTS-68K	
R8	12K		23X20X123K	BTS-12K	
R9	470Ω		23X20X471K	BTS-470	
R10	2700Ω		23X20X272K	BTS-2700	
R11	82Ω		23X20X820K	BTS-82	
R12	8.2Ω5%		23X20X082K		
R13	8.2Ω5%		23X20X082K		

TRANSFORMER (DRIVER)

ITEM No.	Turns Ratio		REPLACEMENT DATA						NOTES
	PRI.	SEC.	TRUETONE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2.7:	1	55-324						

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	TRUETONE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	465Ω CT	11Ω	55-325						

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	TRUETONE PART No.	QUAM PART No.	
SP1	4"	PM	11Ω	85-192	4A07Z11	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		TRUETONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Stick	57C247	14-9013			
L2	Osc. Coil	51-2153	14-9010			
L3	Input IF	50-703				
L4	Output	50-704				

BATTERIES

ITEM No.	VOLTAGE	TRUETONE PART No.	REPLACEMENT DATA								NOTES
			BURGESS		EVEREADY		MALLORY		RAY-O-VAC		
			"A"	"B"	"A"	"B"	"A"	"B"	"A"	"B"	
M1	6V			2R*		950 *		M-13 *		2LP *	

* Requires 4 in series.

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA		NOTES
		TRUETONE PART No.	SYLVANIA PART No.	
M2	1N87 or 1N60	19B1933	1N60	Audio Detector (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	TRUETONE PART No.	NOTES
M3	Tuning Cap	48C379	Two Gang (11-145MMF, 16-96MMF)
	Knob	15-1018	Tuning
	Knob	15-1019	On-Off-Volume
	Cabinet	78E1617	Leather (Complete)
	Battery Holder		
	Form	8B3574	
	Phone Jack	36B085	
	Spring	75B606	Battery Holder

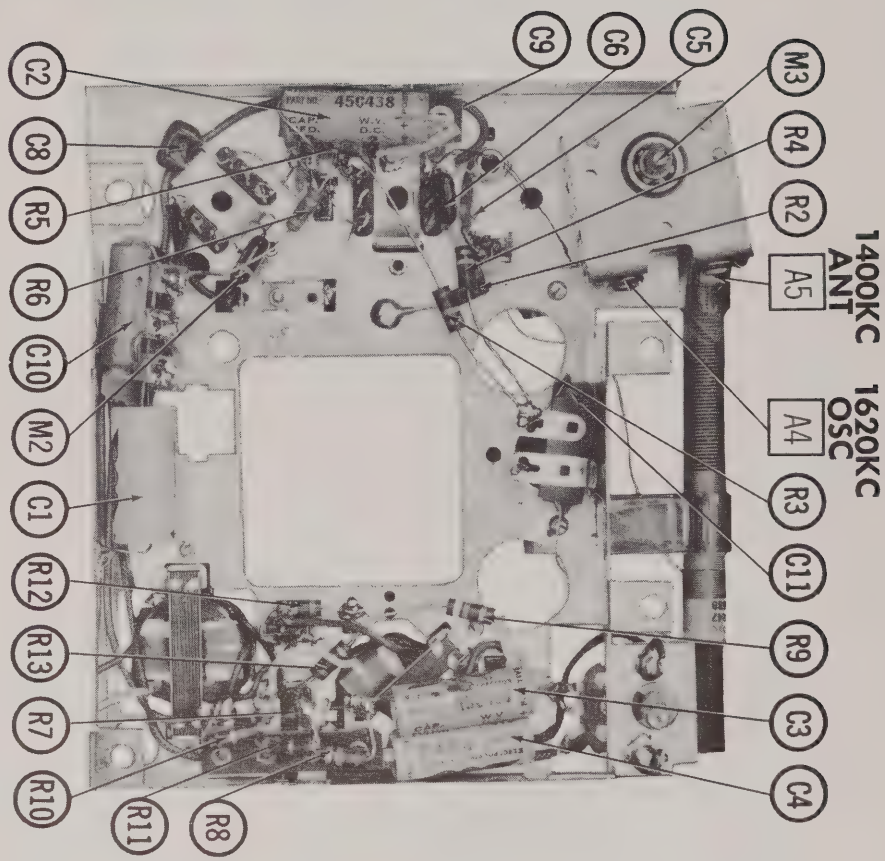
OSCILLATOR INJECTION VOLTAGE ADJUSTMENT

Oscillator injection voltage should be checked if the mixer-osc. (X1) transistor is replaced, if receiver operation is unsatisfactory when the supply voltage drops to approximately 4 volts, if the receiver lacks sensitivity near the low frequency end of the dial, or if "squaging" is present near the high end of the dial.

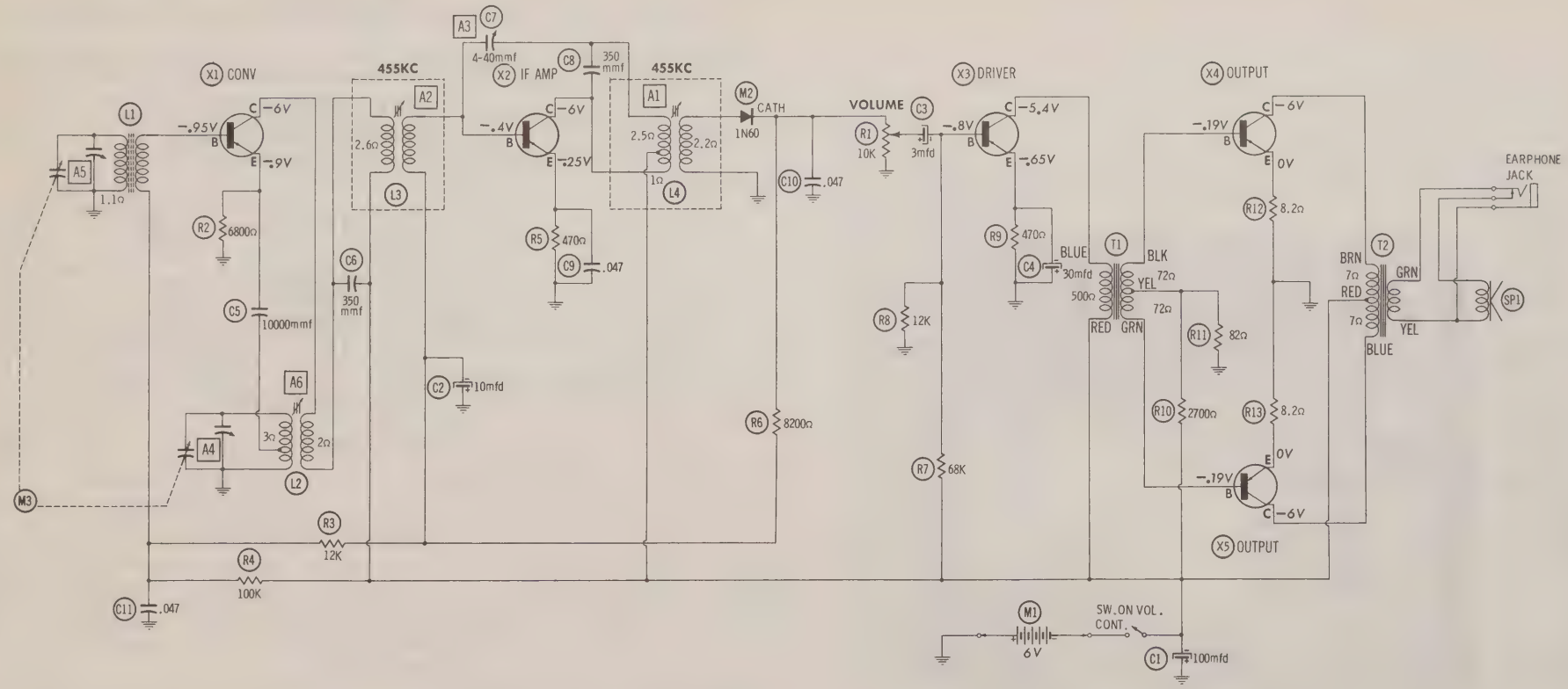
To measure the injection voltage, use a power source of 6 volts DC and connect a sensitive RF voltmeter across R2. The meter should indicate 60 millivolts with the tuning gang closed and should not exceed 150 millivolts with this tuning gang open.

If the injection voltage is not within the approximate limits, loosen the wax seal on the oscillator coil coupling winding and adjust the winding (by sliding) until the readings fall within the limits. Reseal the winding.

CHASSIS—BOTTOM VIEW



TRUETONE MODEL D8716A



RESISTANCE READINGS

ITEM	Base	Emitter	Collector
X1	17K	6800Ω	†4.6Ω
X2	9000Ω	470Ω	†1Ω
X3	12K	470Ω	†500Ω
X4	†2700Ω	8.2Ω	†7Ω
X5	†2700Ω	8.2Ω	†7Ω

TRANSISTORS REMOVED FOR RESISTANCE MEASUREMENTS
† MEASURED FROM NEGATIVE SIDE OF C1

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum. no signal apllied for voltage measurements.

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

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RETMA MEMBER

TRUETONE
MODELS 2D1717, 2D1718, 2D1719

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MODEL 2D1718

TRUETONE
MODELS 2D1717, 2D1718, 2D1719

TRADE NAME	Truetone Models 2D1717, 2D1718, 2D1719
SUPPLIER	Western Auto Supply Co., 2107 Grand Ave., Kansas City, Mo.
TYPE SET	Television Receiver
TUBES	Thirteen
POWER SUPPLY	110-120 Volts AC, 60 Cycle RATING 120 Watts, 1 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

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TRUETONE
MODELS 2D1717, 2D1718, 2D1719

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 6 push-on type control knobs from the front.
2. Remove 8 wood screws and the rear cover.
3. Remove picture tube socket, yoke plug, HV lead, 2 speaker leads and 2 ground straps.
4. Remove 2 wood screws and the AC interlock.
5. Remove 1 metal screw from the front chassis brace.
6. Remove 2 metal screws holding the top of the chassis at the rear of the top.
7. Remove 2 chassis bolts from the bottom.
8. Remove the chassis.
9. To remove the speaker it is necessary to remove the chassis and 4 speed nuts.

MODEL 2D1718

CAUTION NOTE

ONE SIDE OF AC LINE CONNECTED TO CHASSIS
Care should be exercised when connecting test equipment or physically contacting the chassis.

MODELS
2D1717, 2D1718, 2D1719

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SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustment of the VHF oscillator is possible by removing the channel selector and fine tuning knobs. Set the fine tuning at the center of its range. One slug for HIGH band adjustment is located at 4 o'clock, and should be adjusted first. The LOW band adjustment is located at 11 o'clock. Adjust for best picture and sound.

PICTURE TUBE SAFETY GLASS CLEANING

Remove 5 wood screws holding the metal trim across the top edge of the safety glass. Remove safety glass.

FOCUS

The focus may be varied by the position of a strap on the base of the picture tube. The strap can be connected between pins 6 and 10 or 6 and 2. Readjust the ion trap for the best focus consistent with maximum brightness.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

For adjustment of the horizontal oscillator, it is necessary to remove the rear cover and supply power to set. Set the horizontal hold at the center of its range and adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally. (For location see tube placement chart).

FUSES

A 4.7Ω fusible resistor (R67) is used for LV power supply protection. (For location see tube placement chart).

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

TRUETONE
MODELS 2D1717, 2D1718, 2D1719

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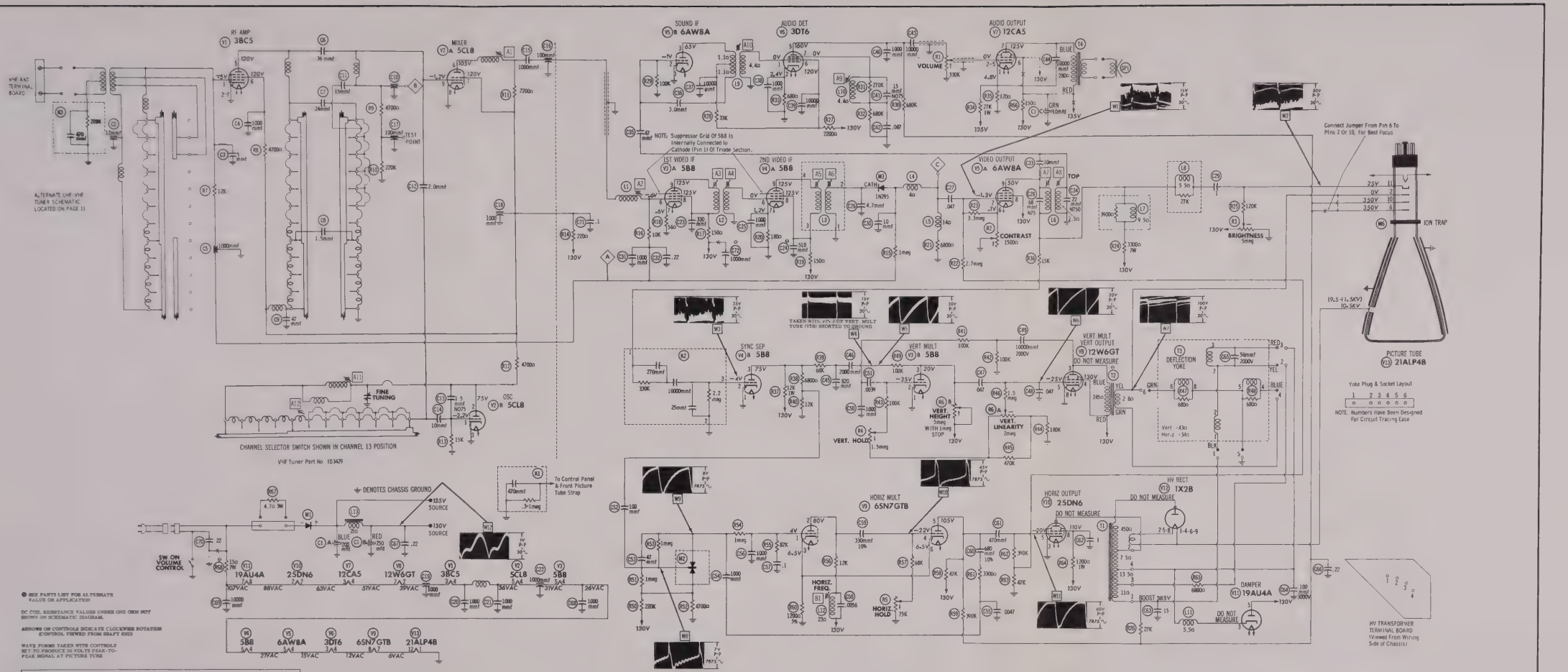

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

WAVE FORMS TAKEN WITH CONTROLS SET TO PRODUCE 30 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE

1. DC voltage measurements taken with vacuum tube voltmeter. AC voltage measured at 1,000 ohms per volt.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage measured at 117 volts for voltage readings.
5. All controls set for normal operation; no signal applied.

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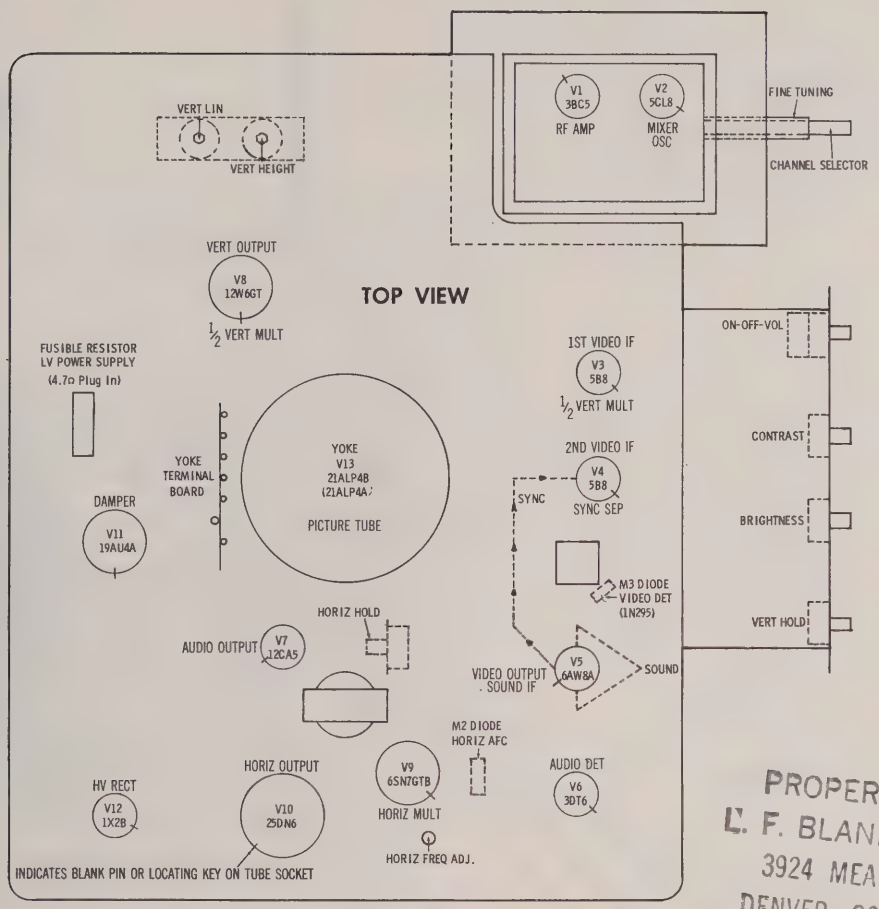
TRUETONE
MODELS 2D1717, 2D1718, 2D1719

TUBE PLACEMENT CHART



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TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

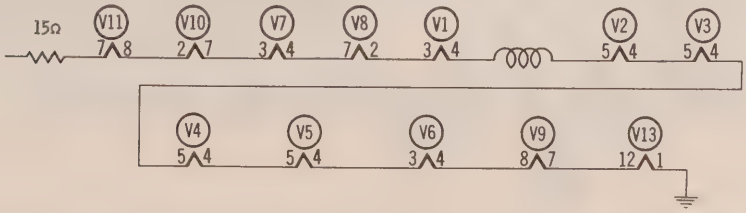
POWER SUPPLY FAILURE
No raster, no sound - Fusible Resistor (R67), Rectifier (M1)

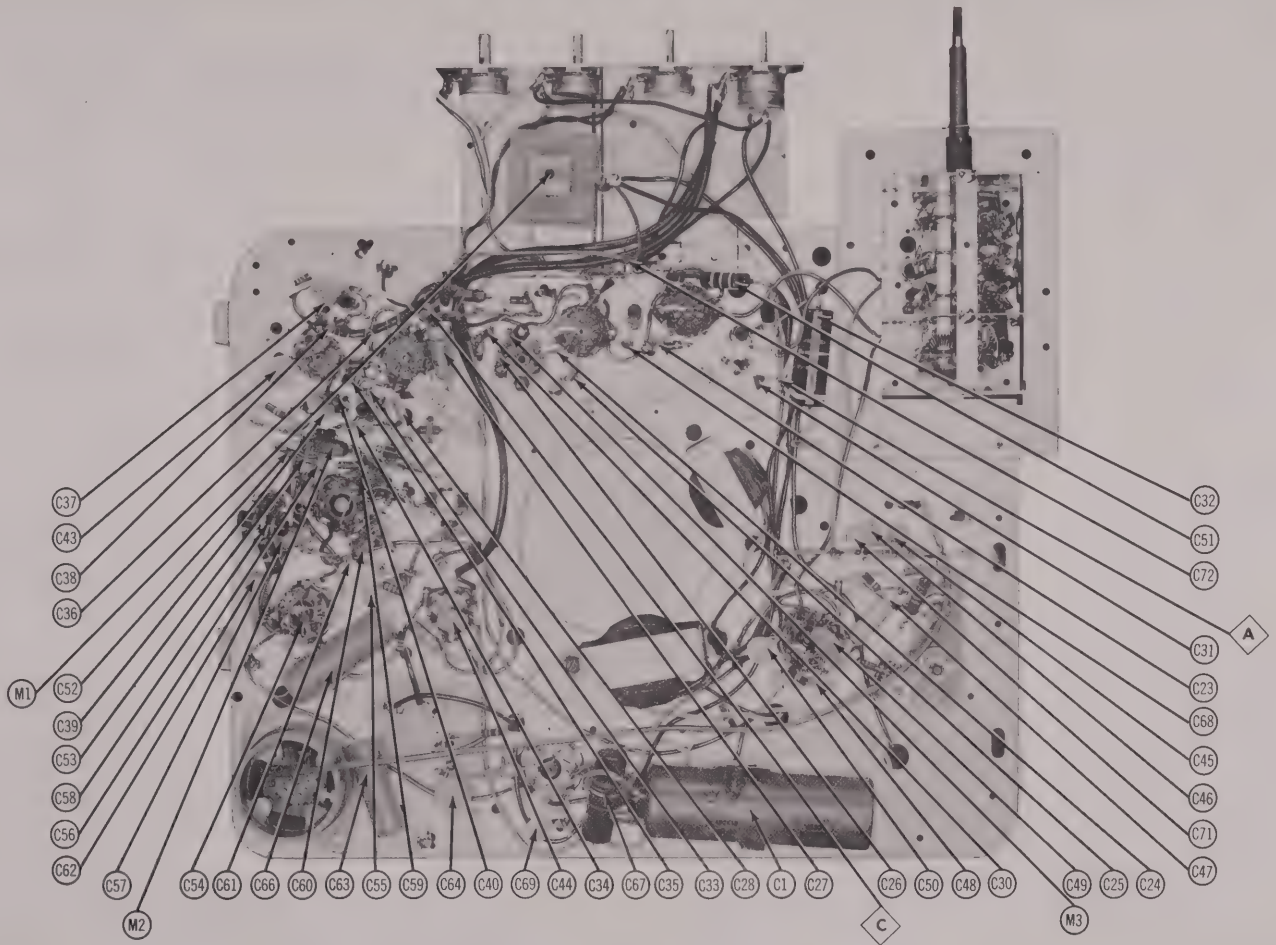
LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V3, V4, Diode (M3), V5
No pic, no sound, has snow - V1, V2
No pic, has sound, has raster - V5, V13
Has pic, no sound - V5, V6, V7

SYNC FAILURE
No vert. sync - V4
No horiz. sync - V4, Diode (M2)
No vert. or horiz. sync - V4

SWEEP FAILURE
No raster, has sound - Diode (M2), V9, V10, V11, V12, V13
No vertical deflection - V3, V8
Poor vert. linearity or foldover - V3, V8
Poor horiz. linearity or foldover - V9, V10, V11
Narrow picture - V9, V10, V11, Rectifier (M1)
Vert. off freq. - V3, V8
Horiz. off freq. - V9

This receiver employs tubes used in a series filament network, an open filament in any tube in the series will cause the set to be inoperative. (See circuit below).





CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

USE AN ISOLATION TRANSFORMER TO PROTECT THE TEST EQUIPMENT.
The High Voltage lead should be securely taped and kept away from the chassis.

VIDEO IF ALIGNMENT

Remove mixer-osc. tube (V2) from its socket and replace with tube having the oscillator grid pin removed. (Pin 1 on 5CL8 or pin 9 on a 5U8). This will disable the local oscillator and reduce possibility of erronious indications.
Connect the negative lead of a 3 volt bias supply to point Ⓐ. Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	1000MMF	High side to point Ⓑ. Low side to chassis.	43.5MC (10MC Swp)	42.75MC 45.75MC	Any non-interfering channel	Vert. Amp. thru detector (Fig. 1) to pin 9 (plate) of 5B8 (V3). Common to chassis.	A1, A2	Adjust for response curve similar to Fig. 2 with markers in proper positions.
2.	"	High side to pin 6 (grid) of 5B8(V3). Low side to chassis.	"	"	"	Vert. Amp. thru detector (Fig. 1) to pin 9 (plate) of 5B8 (V4). Common to chassis.	A3, A4	"
3.	"	High side to pin 6 (grid) of 5B8 (V4). Low side to chassis.	"	"	"	Vert. Amp. to point Ⓒ. Low side to chassis.	A5, A6	"
4.	"	High side to point Ⓑ. Low side to chassis.	"	"	"	"		Retouch A1 thru A6 as needed to obtain response curve similar to Fig. 3.

SOUND IF ALIGNMENT

Set contrast control fully clockwise. Set volume control at the center of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	1000MMF	High side to point Ⓒ. Low side to chassis.	Not used	4.5MC (30% 400∿ AM)	Any non-interfering channel	Vert. Amp. thru detector (Fig. 4) to pin 1 (cathode) of picture tube.	A7	Preset A8 fully counter clockwise. Turn A7 fully clockwise. Then adjust A7 for MINIMUM scope indication.
6.	"	"	4.5MC (15KC Swp)	Not used	"	Across secondary of audio output transformer.	A8, A9, A10	Keep sweep output below limiting level of 3DT6. Turn A9 fully counter clockwise and then clockwise for maximum scope indication. Adjust A8 and A10 for maximum scope indication.

Tune in a strong local TV station and retouch A9 for MINIMUM buzz in speaker and if necessary, repeat step 6.

VHF OSCILLATOR ALIGNMENT

Turn the set on and tune in the highest of the high band (7-13) channels available in the area. Remove the channel selector and fine tuning knobs and adjust the high band oscillator slug (A11) for the best picture and sound. Switch to the highest low band (2-6) channel operating in the area and adjust the low band oscillator slug (A12) for best picture and sound. Replace fine tuning and channel selector knobs.

RF AND MIXER ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

UHF RF AND MIXER ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

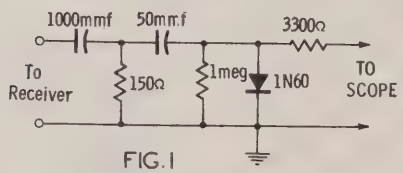


FIG. 1

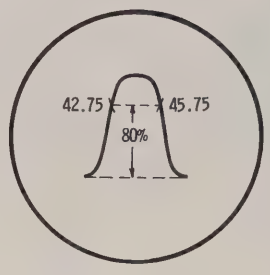


FIG. 2

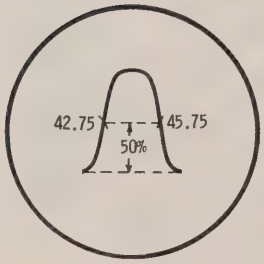


FIG. 3

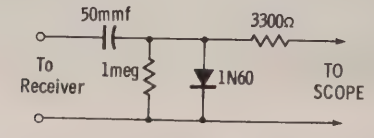


FIG. 4

CHASSIS TOP VIEW

TRUETONE MODELS 2D1717, 2D1718, 2D1719

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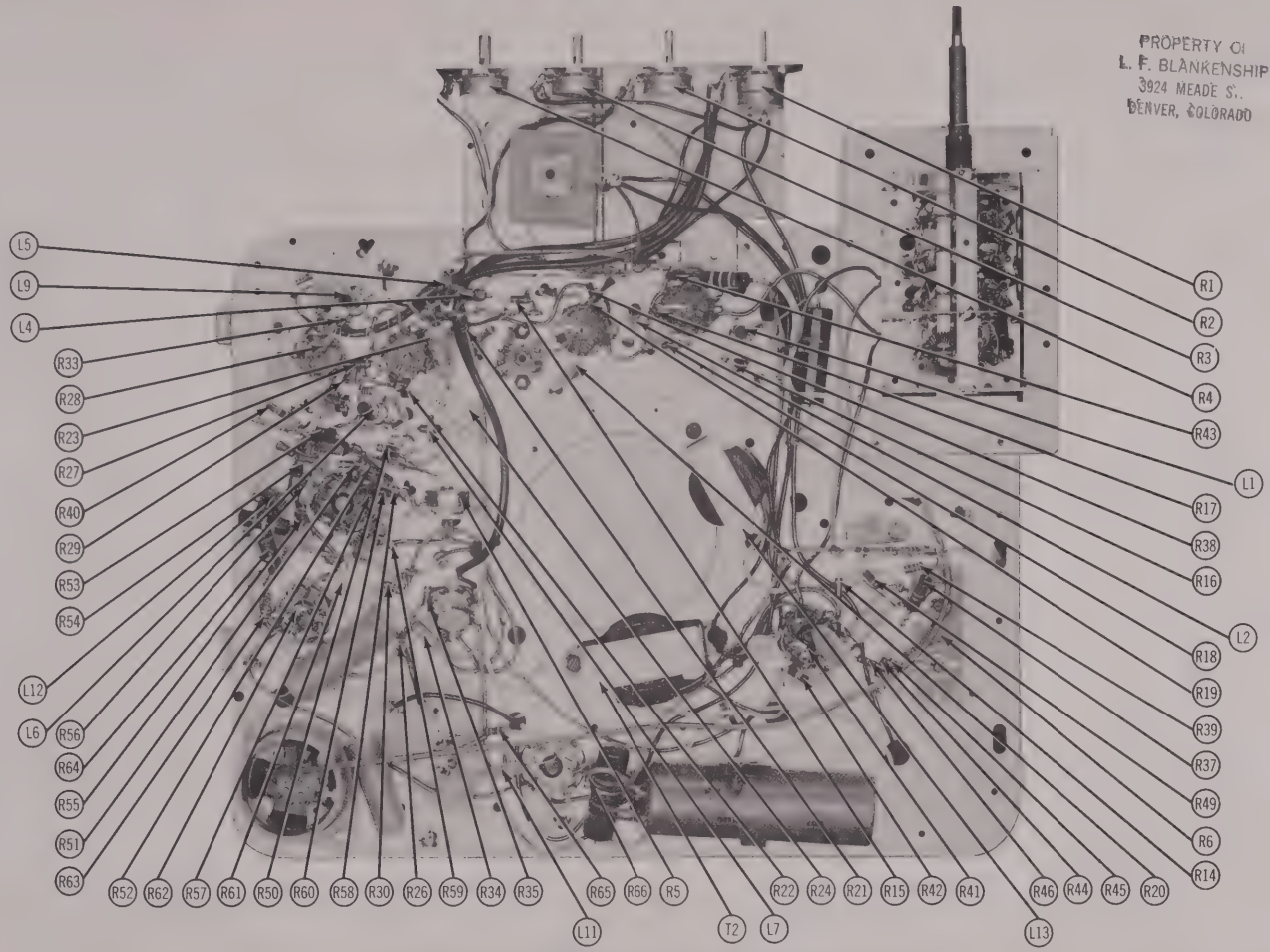
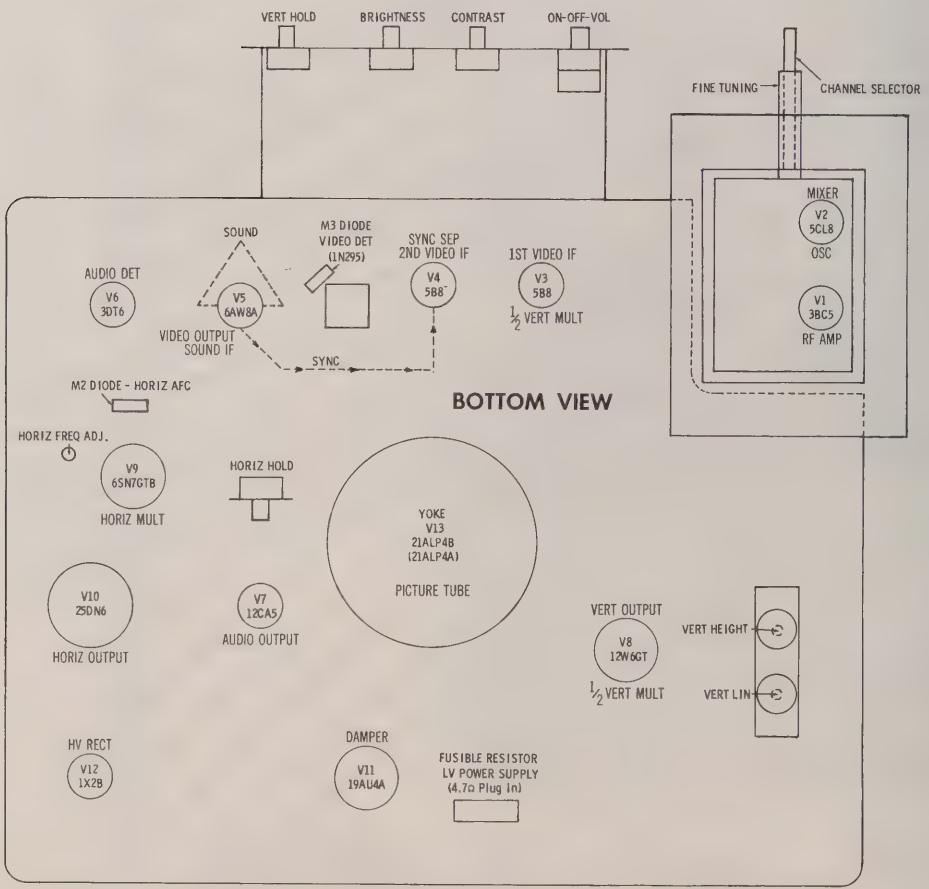


CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

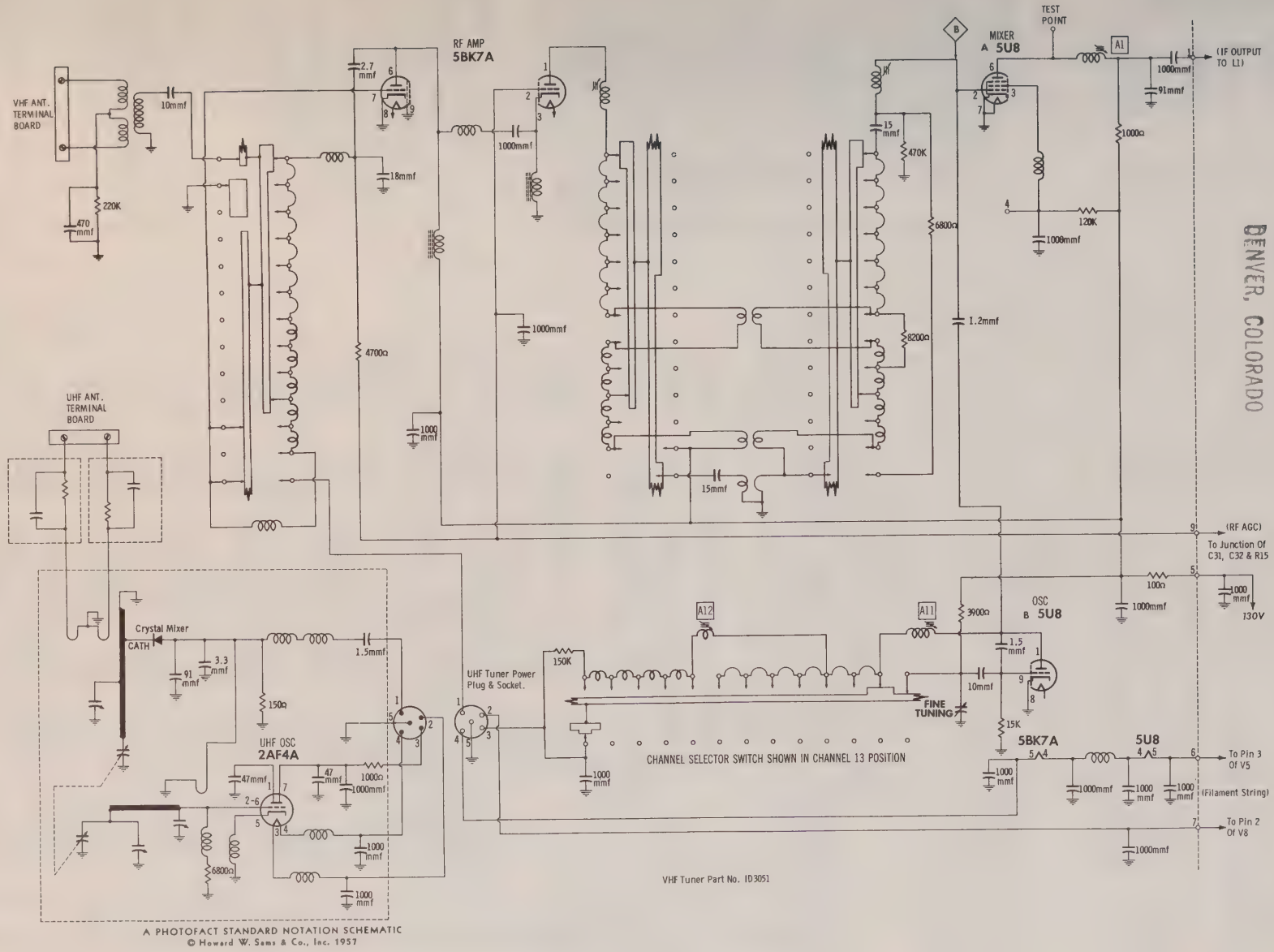
RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	3BC5	1Meg	0Ω	9Ω	8Ω	† 240Ω	† 4900Ω	0Ω		
V2	5CL8	15K	† 4900Ω	0Ω	7Ω	8Ω	† 2400Ω	† 240Ω	0Ω	225K
V3	5B8	0Ω	•1.2Meg	• † 1.8Meg	6Ω	7Ω	1Meg	56Ω	† 170Ω	† 170Ω
V4	5B8	0Ω	2.2Meg	† 9000Ω	5Ω	6Ω	.1Ω	180Ω	† 170Ω	† 170Ω
V5	6AW8A	0Ω	100K	† 35K	3.5Ω	5Ω	• 5Ω	1.5Meg	† 21Ω	† 3300Ω
V6	3DT6	4.4Ω	680Ω	3.5Ω	3Ω	‡ 680K	† 2200Ω	680K		
V7	12CA5	120Ω	• 50K	14Ω	12Ω	• 50K	† 170Ω	† 280Ω		
V8	12W6GT	TP	9Ω	† 265Ω	† 21Ω	• 2.2Meg	TP	12Ω	0Ω	
V9	6SN7GTB	1.8Meg	† 12K	1200Ω	• 75K	† 47K	1200Ω	1.5Ω	3Ω	
V10	25DN6	TP	19Ω	0Ω	TP	400K	TP	14Ω	† 1200Ω	TOP CAP 13Ω
V11	19AU4A	NC	TP	¶	NC	† 21Ω	TP	22Ω	19Ω	
V12	1X2B		PINS	1 THRU 9	HAVE	INFINITE	RESISTANCE			TOP CAP 460Ω
V13	21ALP4B	0Ω	12Ω	PIN 6 ‡ 27K	PIN 10 ‡ 27K	PIN 11 • 130K	PIN 12 1.5Ω			

TP TIE POINT
NC NO CONNECTION
† MEASURED FROM OUTPUT OF M1.
• THIS READING WILL VARY, CONTROL SET FOR NORMAL OPERATION
‡ MEASURED FROM PIN 3 OF V11.
¶ THIS READING CAN VARY GREATLY, (10KC MINIMUM), DUE TO THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.



TUBE PLACEMENT CHART



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ALTERNATE TUNER SCHEMATIC

TRUETONE MODELS 2D1717, 2D1718, 2D1719

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amplifier	3BC5	
V2	Mixer-Oscillator	6CL6	
V3	1st. Video IF - Vert Mult	6S8	
V4	2nd Video IF - Sync Sep	6S8	
V5	Video Output-Sound IF Amp	6AW8A	
V6	Audio Detector	3DT6	
V7	Audio Output	12CA5	
V8	Vert Multi.-Vert.Output	12AW8T	
V9	Horiz Mult	6BN7GTB	
V10	Horiz Output	25DN6	
V11	Damper	19AU4A	
V12	HV Rectifier	1X2B	

PICTURE TUBE

ITEM No.	REPLACEMENT DATA				NOTES
	TRUETONE PART No.	CBS PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	
V13	ZA1P4B	ZA1P4B 1/ ZA1P4A 2/ ZA1P4	ZA1P4B 1/ ZA1P4A 2/ ZA1P4	ZA1P4A 2/ ZA1P4B 1/	1/ Silver screen "85" 2/ Aumiinized

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP	VOLT	TRUETONE PART No.	AEROVOX PART No.	CORNELL DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	200	150	45C391	PR1-0L3		WT320	CDB-T-1015	D-095 MT-1510	R2294 *
B	250	150							
C	10	150							

* Non-catalog item

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							
	CAP	VOLT	TRUETONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	IRC PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C3	12			BPD-00005	DD-050	L10V5	ED-5		5GA-V5	
C4	1000			BPD-001	DD-103	BYA5DI	ED-1000	DC5DI	5HK-DI	
C5	1000			EF-001	MFT-1000				5GC-DI	
C6	56									
C7	24			NPO-SI 1.5	TCZ-1R5	C10V15C	TCO-1.5	IZT-5S1h	5TCCB-V15	
C8	47			BPD-000047	DD-470	L40Q47	ED-47	UC-5447	5GA-Q47	
C10										
C11	15			BPD-000015	DD-150	L10Q15	ED-15	UC-5415	5GA-Q15	
C12	2.0			NPO-SI 2.2	TCZ-2R2	C10V2C	TCO-2.2		5TCCB-V2h	
C13	1.5									N075
C14	10			SI 10	DS-100	LT9Q1	GP-10	UC-541	5GA-Q1	
C15	1000			BPD-001	DD-103	BYA5DI	ED-1000	DC5DI	5HK-DI	
C16	100									
C17	100									
C18	1000			EF-001	MFT-102				5GC-DI	
C19	1000			EF-001	MFT-102				5GC-DI	
C20	1000			BPD-001	DD-103	BYA5DI	ED-1000	DC5DI	5HK-DI	
C21	1000			BPD-001	DD-103	BYA5DI	ED-1000	DC5DI	5HK-DI	
C22	1000			EF-001	MFT-103				5GC-DI	
C23	330		47A641	BPD-00033	DD-331	L10T33	ED-330	UC-5333	5GA-T33	
C24	510			BPD-0006	DD-501	L10T51	ED-510	UC-535	5GA-T5	Note 1
C25	1000		47A230	BPD-001	DD-103	BYA5DI	ED-1000	DC5DI	5HK-DI	
C26	4.7		47B403-S	NPO-SI 4.7	TCZ-4R7	C7AV47C	TCO-4.7	ZT-5547	5TCCB-V47	
C27	.047	200	45B743L2	DF-503	CUB2B47			GEM-2147	2TM-S47	
C28	68		47-535							N75
C29	.1	300	45B7104L2	PS88N-I	DF-104	CUB2P1		GEM-201	2TM-P1	
C30	10		47AC20A100K	SI 10	DS-100	LT9Q1	GP-10	UC-541	5GA-Q1	
C31	1000		47A230	BPD-001	DD-103	BYA5DI	ED-1000	DC5DI	5HK-DI	
C33	.22	300	45B7224L2	PS88N-23		CUB2P23		GEM-3022	2TM-P22	
C33	10		47A180-11	SI 10	DS-100	LT9Q1	GP-10	UC-541	5GA-Q1	
C34	22		47-534		MT50-SI 22	TCR-22	C20Q22C	TCT-22	5TCC-Q22	N750
C35	47		47CA20A470M	SI 47	DS-470	LT9Q47	GP-47	UC-5447	5GA-Q47	
C36	3.0		47A807	NPO-SI 3.0	TCZ-3R2	L7V3	TCO-3	IZT-553	5TCCB-V33	
C37	10000		47-A226	BPD-001	DD-103	BYA5DI	ED-01	DC5U	5HK-DI	
C38	1000		47-A230	BPD-001	DD-103	BYA5DA	ED-1000	DC52	5HK-DI	
C39	10000		47-A224	BPD-01	DD-103	BYA5DI	ED-01	DC5U	5HK-DI	
C40	1000		47-A230	BPD-001	DD-103	BYA5DI	ED-1000	DC52	5HK-DI	
C41	15		47B400							N075
C42	.047	200	45B7473L2	BPD-05	DF-503	CUB2B47		GEM-2147	2TM-S47	
C43	10000		47-A224	BPD-01	DD-103	BYA5DI	ED-01	DC5U	5HK-DI	
C44	10000		47-A224	BPD-01	DD-103	BYA5DI	ED-01	DC5U	5HK-DI	
C45	820		47-606	BPD-0008	DD-820	BYA10T92	ED-820		5GA-T82	
C46	2000		47A195	BPD-003	DD-203	BYA5DJ2	ED-002	DC522	5HK-DJ2	
C47	.047	300	46B7473E2	BPD-05	DF-503	CUB2B47		GEM-2147	2TM-S47	
C48	.047	300	46B7473E2	BPD-05	DF-503	CUB2B47		GEM-2147	2TM-S47	
C48	10000	3000	47-706	P2D56C2M-01				GEM-3081		
C50	1000		47A586	BPD-001	DD-102	BYA5DI	ED-1000	DC52	5HK-DI	
C51	.0068	600	46B7382E4	BPD-004	DE-682	CUB4D68	KP-4000	GEM-4268	4TM-D4	
C53	100		47CA30A101M	SI 100	DS-101	LT9T1	GP-100	UC-551	5GA-T1	
C53	47		47CA30A470M	SI 47	DS-470	LT9Q47	GP-47	UC-5447	5GA-Q47	
C54	1000		47-503	BPD-001	DD-102	BYA5DI	ED-1000	DC52	5HK-DI	
C55	.0047	600		BPD-0047	DD-472	CUB4D47	KP-4700	GEM-5447	5TM-D47	
C56	1000		47A230	BPD-001	DD-102	BYA5DI	ED-1000	DC52	5HK-DI	
C57	.1	300	46B7104L2	P2S8N-I	DF-104	CUB2P1		GEM-201	2TM-P1	
C58	.0056	600	46B5562E4		DE-562	CUB4D56	KP-5600	GEM-4256	4TM-D5	
C59	330		47E30D331K	1469-00033	DS-331	S2S733			M5-333	10%
C60	680		47E30D681K	1464-00068	DS-681	S2S768			M5-683	10%
C61	470		47A856	BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	5GA-T47	
C62	.1	300	46B7104L2	P2S8N-I	DF-104	CUB2P1		GEM-201	2TM-P1	
C63	.15	600	46B7154L6	P2S8N-.5		CUB6P15		GEM-6015	6TM-P15	
C64	100	3000	47-570	HVD-30-100	D030-101	HVB30T1	HDB-100	DC3031	30GA-T1	
C65	.56	3000	47A837		D030-.560	HVA30Q56	HDB-56	DC3056	30GA-Q56	
C66	.33	600	46B7234L6	P6S8N-22		CUB6P22		GEM-6022	6TM-P22	
C67	.33	300	46B7234L2	P2S8N-22		CUB2P22		GEM-6022	2TM-P22	
C68	1000		47A230	BPD-001	DD-102	BYA5DI	ED-1000	DC52	5HK-DI	
C69	.33	600	46B6234L6	P6S8N-22		CUB6P22		GEM-6022	6TM-P22	
C71	.1	300	46B7104L2	P2S8N-I	DF-104	CUB2P1		GEM-201	2TM-P1	
C72	1000		47A230	BPD-001	DD-103	BYA5DI	ED-1000	DC52	5HK-DI	Note 2

Note 1: Some versions may use 560mmf.
Note 2: Not used in some versions.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESIST ANCE	WATTS	TRUETONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	350K	1	25B1150	G-60	A47-500K-Z	Q13-132	TA354A	Volume
B	Shaft			Not Req.	F8-3	Not Req.	Not Req.	
C	Switch			XB-1	SWE-13	7E-1	US-25	
R2A	1500Ω	1	25B1102	AB-515		Q7-109	U5	Contrast
B	Shaft			AK-3		Not Req.	Not Req.	
R3	5Meg	1/2	25B1254	B-88		Q7-142	TA58R	Brightness
R4A	1.5Meg	1/2	25B1256	B-742	A47-1.5Meg-B	Q11-136	TA185L	Vert. Hold
B	Shaft			Not Req.	F8-3	Not Req.	Not Req.	
R5A	75K	1	25-1305	B-35	A47-75K-B	Q11-125	PTA15L	Horiz. Hold
B	Shaft			Not Req.	F8S-1/2	Not Req.	Not Req.	
R6A	2Meg	1/2	25B1356					Vert. Lin. Vert. Height with 1Meg stop
B	5Meg	1/2						

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA			NOTES
	OHMS	WATT	TRUETONE PART No.	IRC PART No.		
R7	12K			BTS-12K		
R8	4700Ω			BTS-4700		
R9	4700Ω			BTS-4700		
R10	220K			BTS-220K		
R11	2200Ω			BTS-2200		
R12	4700Ω			BTS-4700		
R13	15K			BTS-15K		
R14	220Ω		23X0X221K	BTS-220		
R15	1Meg		23X0X105K			
R16	10K		23X0X103K	BTS-10K		
R17	100Ω		23X0X101K			
R18	56Ω		23X0X560K	BTS-56		
R19	150Ω		23X0X151K			
R20	180Ω		23X0X181K	BTS-180		
R21	68000		23X0X683K	BTS-6800		
R23	2.7Meg		23X0X275K	BTS-2.7Meg		
R23	3.3Meg		23X0X335K	BTS-3.3Meg		
R24	10000Ω	7	44A132	PWT-3300		
R25	130K		23X0X134K	BTS-130K		
R26	27K		23X0X273K	BTS-27K		
R27	2200Ω		23X0X222K	BTS-2200		
R28	33K		23X0X333K	BTS-33K		
R29	100K		23X0X104K	BTS-100K		
R30	680K		23X0X684K	BTS-680K		
R31	270K		23X0X274K	BTS-270K		
R32	680K		23X0X684K	BTS-680K		
R33	680Ω	1	23X0X681K	BTS-680		
R34	27K	1	23X0X273K	BTA-27K		
R35	130Ω		23X0X131K	BTS-130		
R36	18K		23X0X183K	BTS-18K		
R37	18K	1	23X0X123K	BTA-12K		

ITEM No.	RATING		REPLACEMENT DATA			NOTES
	OHMS	WATT	TRUETONE PART No.	IRC PART No.		
R38	6800Ω		23X0X682K	BTS-6800		
R39	68K		23X0X683K	BTS-68K		
R40	12K		23X0X123K	BTS-12K		
R41	100K		23X0X104K	BTS-100K		
R42	100K		23X0X104K	BTS-100K		
R43	100K		23X0X104K	BTS-100K		
R44	180K		23X0X184K	BTS-180K		
R45	470K		23X0X474K	BTS-470K		
R46	1.5Meg		23X0X155K	BTS-1.5Meg		
R47	680Ω		23X0X681K			
R48	680Ω		23X0X681K			
R49	100K		23X0X104K	BTS-100K		
R50	220K		23X0X224K			
R51	1Meg		23X0X105K			
R52	4700Ω		23X0X472K			
R53	1Meg		23X0X105K			
R54	1K0g		23X0X105K			
R55	82K		23X0X823K			
R56	12K		23X0X123K			
R57	68K		23X0X683K			
R58	47K		23X0X473K			
R59	390K		23X0X394K			
R60	1200Ω 5%		23X0X1R2	BTS-1200 5%		
R61	3300Ω		23X0X332K	BTS-3300		
R62	390K		23X0X394K	BTS-390K		
R63	47K		23X0X473K	BTS-47K		
R64	1200Ω	1	23X0X123K	BTA-1200		
R65	68000Ω		23X0X683K			
R66	150Ω		23X0X151K	BTS-150		
R67	4.7Ω	3	34B105			
R68	15Ω	7	24-1109	PWT-15		Note 1

Note 1. VHF/UHF Models use a 10Ω, 7W resistor (24-1109) in this application.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA							
		TRUETONE PART No.	Halldorson PART No.	Merit PART No.	RCA TYPE No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	Horiz. Output	55-301							
T2	Vert Output	55-303	Z1900 1/	A-2822 2/				28S75 1/	A-10BX 2/
T3A	Alternate Vert. Output	55-329							
	Yoke (90°) Horiz. (25MH)	53-396	DF907 3/4/	MDF-52 2/ 5/	239DG 4/ 5/	Y90F19/43 2/ 5/	DY-16A 3/	Y-16 3/4/	Y-4L/K99, YCL, & CLI
	Vert.(39MH)								
M5	Rear Cover & Centering Device	21C158-D							

1/ Use 6 to 1 turns ratio.
2/ Drill new mounting hole(s).
3/ Use original yoke damping network.
4/ Use original rear cover and centering device.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	TRUETONE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T4	4300Ω	3-4Ω	55-306	Z1107 1/	A-3036	A-3877 2/	34S51 2/	S-6X	1/ Drill one new mounting hole.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V C IMP	TRUETONE PART No.	QUAM PART No.	
SP1	4" x 8"	PM	3-4Ω	85C197	40A1	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		TRUETONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	1st. Video IF	51-3187			TV-131	6235
L2	2nd. Video IF	51-3188				
L3	3rd. Video IF	50-568				
L4	RF Choke	25A307	19-1006			4634 18 Microhenries
L5	Shunt Peaking Coil	51-3102	19-3560			6148 710 Microhenries
L6A	4.5MC Trap	51N1996			TV-130	
B	1st. Sound IF					
L7	Shunt Peaking Coil	51-3101	19-6400 *			6134 * 396 Microhenries, wound on 3900Ω resistor
	Series Peaking Coil	51A3184	19-3180 *			6130 * 160 Microhenries, wound on 47K resistor
L8	2nd. Sound IF	51-3166				
L10	Quadrature Coil	51A1967	20-1008 *		TV-132	1480 *
L11	RF Choke	53-342				

* Parallel with 3900Ω resistor.
* Parallel with 47K resistor.
* Drill new mounting hole.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES		REPLACEMENT DATA						NOTES
	PRI.	SEC.	TRUETONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	RCA TYPE No	Ram PART No.	Thordarson PART No.
L12	23Ω		51-3169	19-1878		6210 *			HH-4 7.8-30.5 Millihenries

* Enlarge mounting hole. A 3900MMF cap. may have to be used in place of C58.

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					
	TOTAL DIRECT CURRENT	D C RESISTANCE	INDUCTANCE @ CURRENT 1000 ^a/1	TRUETONE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L13	.250A	21Ω	.56 Hy	56A250	C-9041 1/	C-2926 1/	C-2328 1/	26C44 1/	C-2TX

1/ Drill one new mounting hole.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	TRUETONE PART No.	REPLACEMENT DATA	
K1	Control Panel Isolation	470MMF, 3-1Meg		Centralab	RC-471
K2	Sync Take-off	33MMF, 10000MMF, 270MMF, 2.5Meg, 330K	49A046	Aerovox Centralab Sprague	PA-633 CP-383 ST-3
K3	Antenna Isolation	470MMF, 220K			

RECTIFIERS

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CURRENT (Measured)		TRUETONE PART No.	FEDERAL PART No.	GENERAL ELECTRIC PART No.	INTERNATIONAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.		
M1	280A		27-434 1/	1023A 1/	1N1007 2/	R3250BL1 1/	6250 1/	350A 1/		
M2			27-425 3/ 3/	1125 1/ 4/		1T1 1/ 4/				

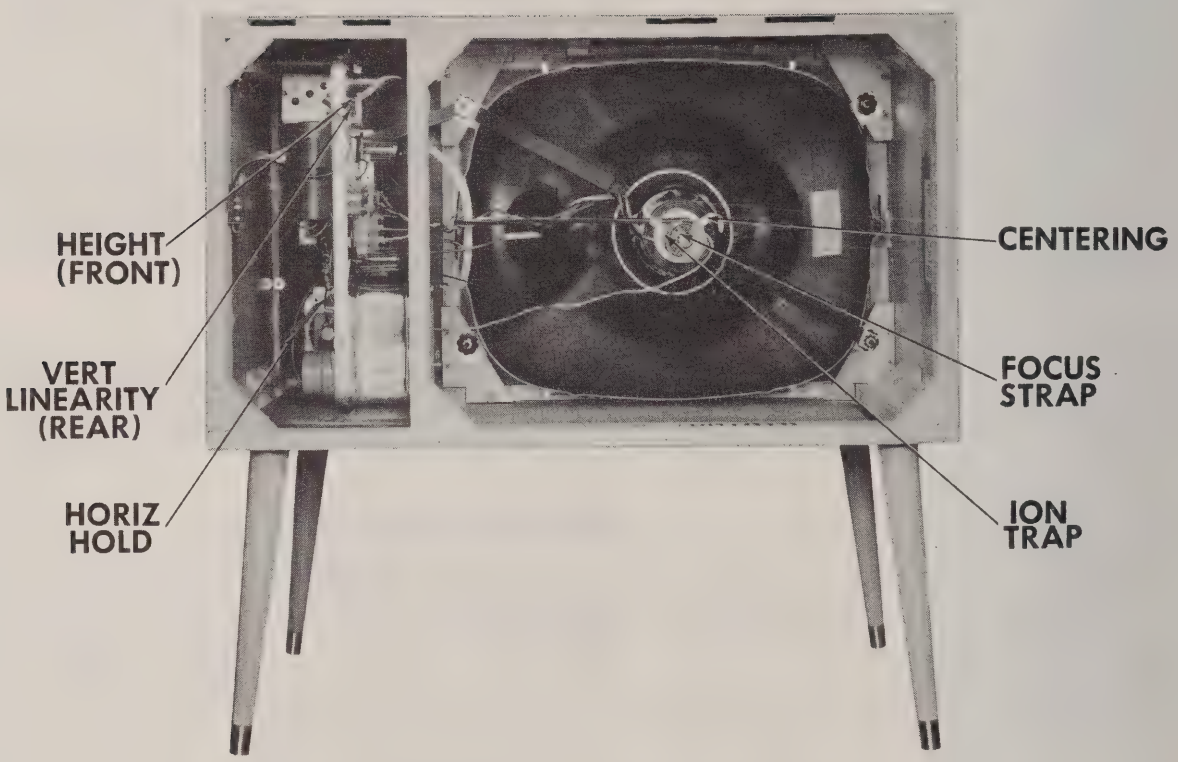
1/ Selenium type.
2/ Germanium type.
3/ Horizontal Phase Detector.
4/ Two (2) required.

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA		NOTES
		TRUETONE PART No.	SYLVANIA PART No.	
M3	1N295	19C1990	1N90	Video Detector (Pigtail)

MISCELLANEOUS

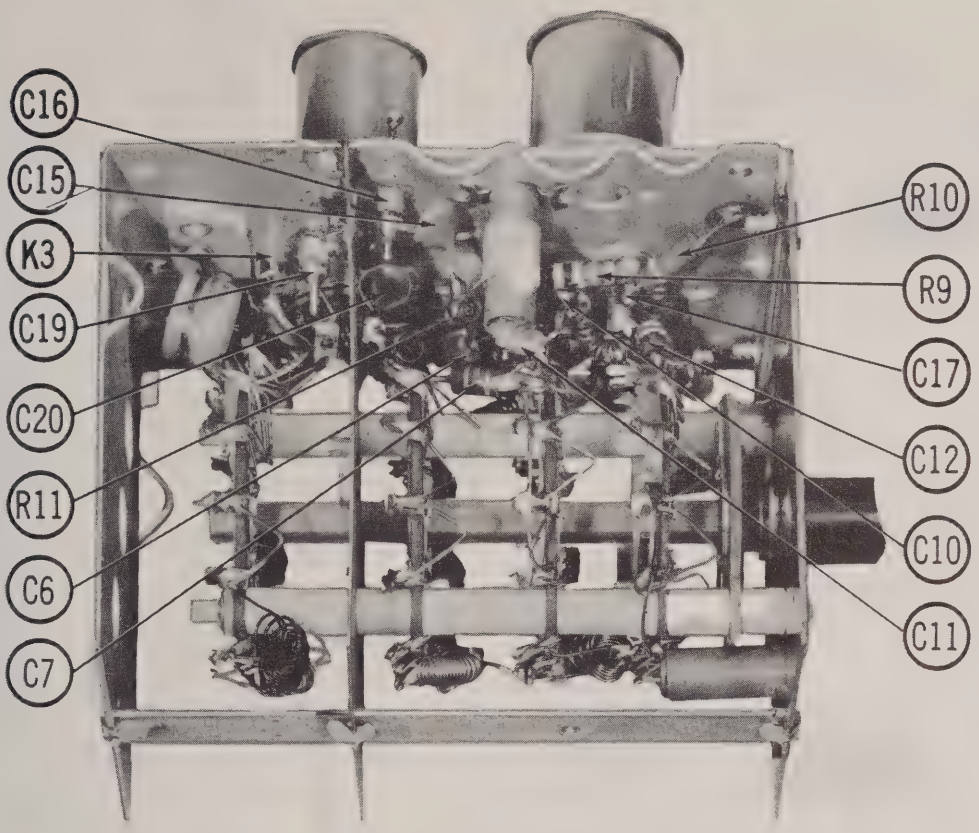
ITEM No.	PART NAME	TRUETONE PART No.	NOTES
M4	Tuner	1A3429	VHF
	Tuner	1D0501	UHF-VHF
M5	Centering Device	21C158-D	Includes rear yoke cover
M6	Ion Trap	21B168	
	Safety Glass	2Z-624	
	Mask	7A691	
	Knob	15D1149	VHF Channel Selector (Beige) Model 2DT18
	Knob	15D1147	VHF Channel Selector (Mahogany) Model 2DT17
	Knob	15B1109	UHF-VHF Channel Selector - Model 2DT19
	Knob	15A1117	VHF Fine Tuning (Beige) Model 2DT18
	Knob	15A1115	VHF Fine Tuning (Mahogany) Model 2DT17
	Knob	15B1110	UHF Fine Tuning (Clear) Model 2DT19
	Knob	15B1108	UHF-VHF Fine Tuning - Model 2DT19
	Knob	15C1111	UHF Indicator Dial (Beige) Model 2DT19
	Knob	15B1115	On-off-volume, Contrast, Brightness, Vert. Hold
	Cabinet	76R1618	Mahogany - Models 2DT17, 2DT19
	Cabinet	76R1619	Limed Oak - Models 2DT18, 2DT19
	Leg	78C1623	Mahogany
	Leg	78C1624	Limed Oak



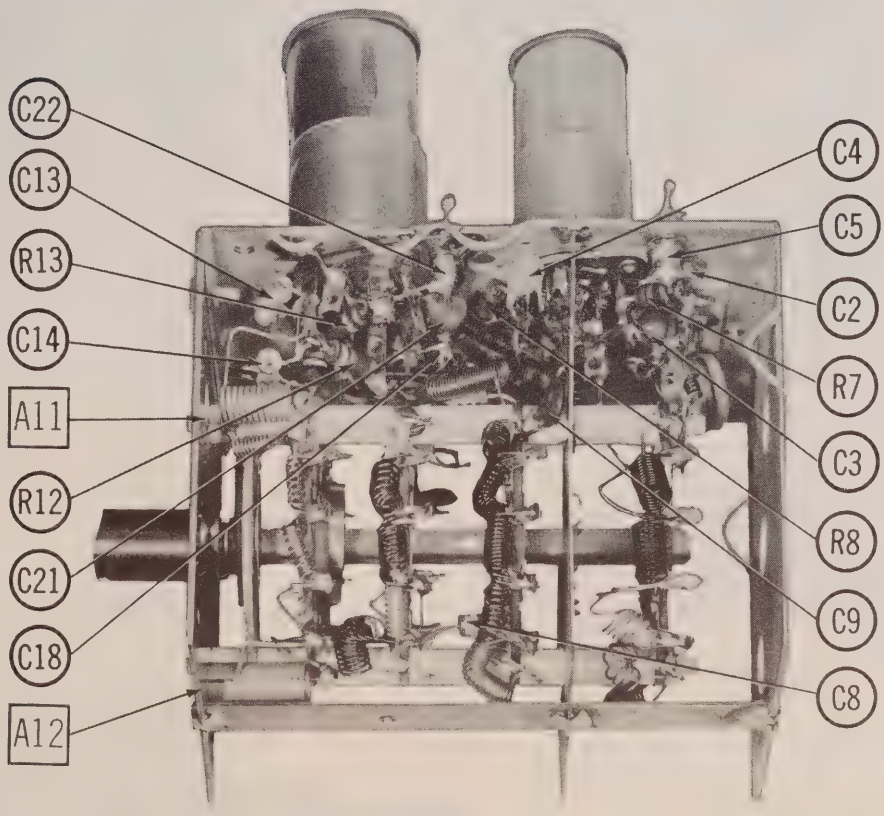
CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably with a test pattern. If the horizontal hold control fails to maintain sync, set it in the center of its range and adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally. Check sync on other channels and if necessary, readjust B1 SLIGHTLY for best sync on all channels.



RF TUNER-LEFT SIDE



RF TUNER-RIGHT SIDE

PROPERTY OF
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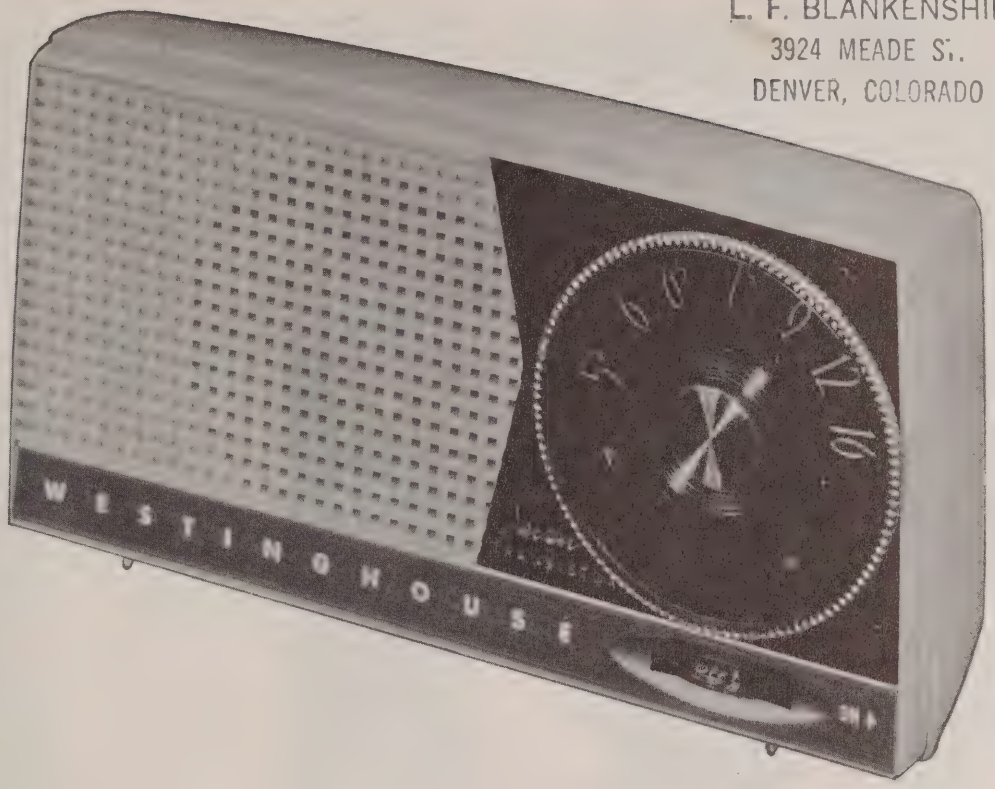
3924 MEADE ST.
DENVER, COLORADO

WESTINGHOUSE MODELS H-587P7A, H-588P7A, H-589P7A, H-617P7, H-618P7, H-619P7 (Ch. V-2278-3)



WESTINGHOUSE MODELS H-587P7A, H-588P7A, H-589P7A, H-617P7, H-618P7, H-619P7 (Ch. V-2278-3)

TRADE NAME Westinghouse Models H-587P7A, H-588P7A, H-589P7A, H-617P7, H618P7, H-619P7 (CH. V-2278-3)
MANUFACTURER Westinghouse Electric Corp., TV-Radio Div., Metuchen, N.J.
TYPE SET Battery Operated Transistorized AM Receiver

POWER SUPPLY 9 Volts DC RATING 6MA@ 9 volts DC
TUNING RANGE—BROADCAST 540KC - 1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1		Loop	455KC (400~ Mod)		Tuning gang fully closed	Across voice coil	A1, A2, A3	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2		"	1625KC		Tuning gang fully open	"	A4	"
3		"	1400KC		Tune to 1400KC signal	"	A5	"

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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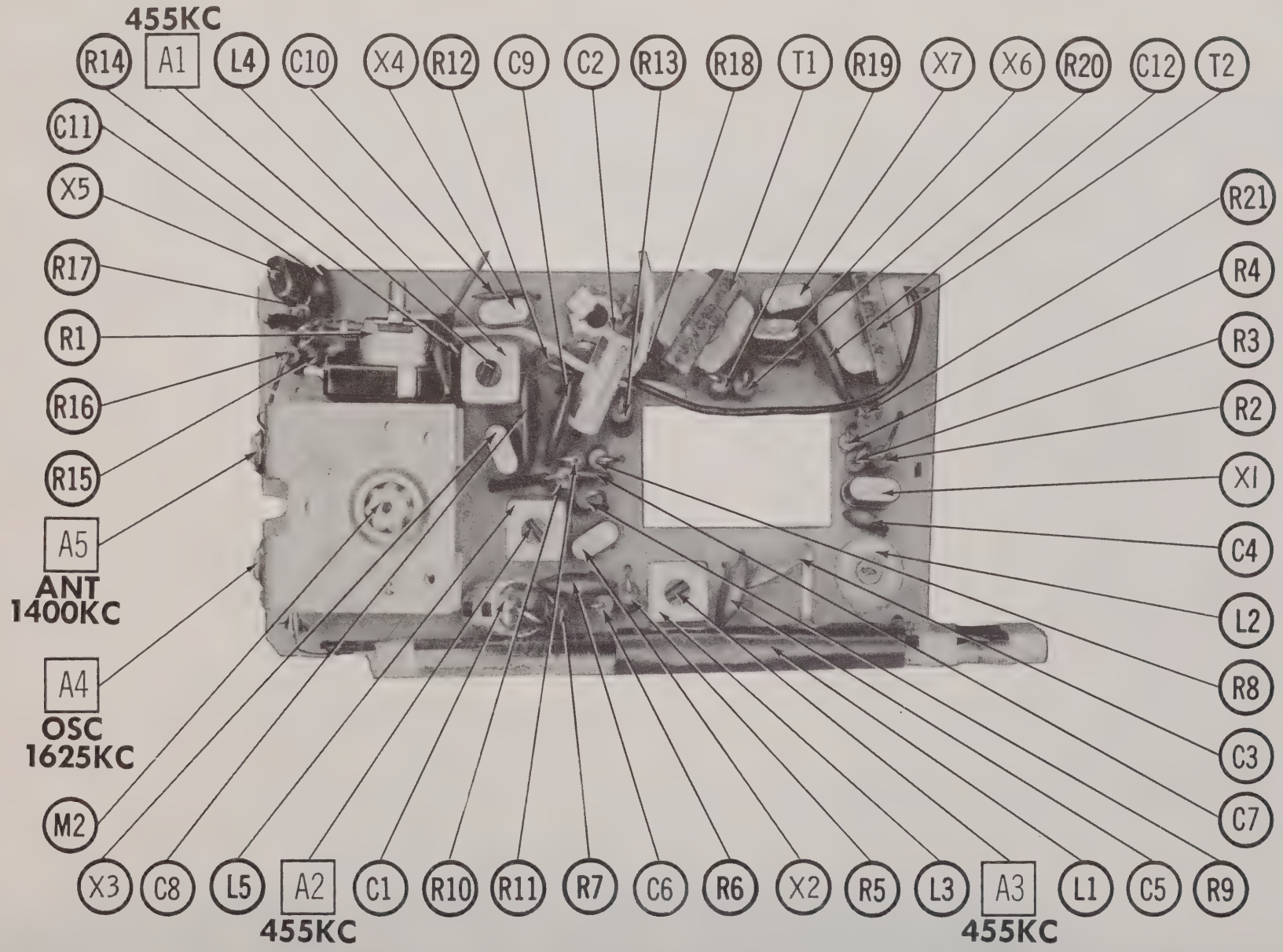


CHASSIS-TOP VIEW

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	USE	Westinghouse PART No.	Notes
X1	Converter (2N252)	297V008M01	
X2	1st. IF Amp. (2N253)	297V002M04	
X3	2nd. IF Amp. (2N254)	297V002M05	
X4	Det. -AVC (880)	297V005M01	
X5	Driver (2N238)	297V004M01	
X6	Output (2N185)	297V003M01	Note 1
X7	Output (2N185)	297V003M01	Note 1

Note 1. X6 & X7 should be a matched pair

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	Westinghouse PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	40	10	218V012M01	XPP10V40	NL50-10	TT10X50	ML40-15		R2329*
C2	40	3	218V012M02	XPP3V40	NL40-3	TT3X40	ML40-6		TE-1057

* Non catalog item

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	Westinghouse PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C3	4700		215V300M04	BPD-0047	DD-472	BYA10D47	ED-0047	UC-5247	5HK-D47	
C4	1000		215V300M15	BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	
C5	10000		215V300M12	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C6	10000		215V300M12	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C7	10000		215V300M11							
C8	50000		215V303M03	BPD-05	DF-503				5HK-S5	
C9	10000		215V300M12	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C10	10000		215V300M11							
C11	1000		215V300M15	BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	
C12	50000		215V303M03	BPD-05	DF-503				5HK-D5	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Westinghouse PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	5000Ω	1/4	270V024M01					Volume & Switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Westinghouse PART No.	IRC PART No.	
R2	39K		250V223A93	BTS-39K	
R3	8200Ω		250V228A22	BTS-8200	
R4	4700Ω		250V224A72	BTS-4700	
R5	3900Ω		250V223A92	BTS-3900	
R6	15K		250V221A53	BTS-15K	
R7	1000Ω		250V231A02	BTS-1000	
R8	2200Ω		250V222A22	BTS-2200	
R9	1000Ω		250V221A02	BTS-1000	
R10	15K		250V221A53	BTS-15K	
R11	470Ω		250V224A71	BTS-470	
R12	3300Ω		250V223A32	BTS-3300	
R13	330Ω		250V223A31	BTS-330	
R14	330K		250V223A34	BTS-330K	
R15	680Ω		250V226A81	BTS-680	
R16	82K		250V228A23	BTS-82K	
R17	220Ω		250V222A21	BTS-220	
R18	6800Ω		250V226A82	BTS-6800	
R19	100Ω		250V221A01	BTS-100	
R20	10Ω		250V221A00	BTS-10	
R21	220Ω		250V232A21	BTS-220	

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (DRIVER)

ITEM No.	Turns Ratio		REPLACEMENT DATA						NOTES
	PRI.	SEC.	Westinghouse PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2:	1	430V024M01 ①	GH117		TA-5	TR-7		① Alternate part #430V024M02

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	Westinghouse PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	1200Ω CT	11Ω	430V025M01①						① Alternate part # 430V025M02

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	Westinghouse PART No.	QUAM PART No.	
SP1	2 3/4"	PM	11Ω	570V004M01		

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		Westinghouse PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Stick	310V012M03				
L2	Osc. Coil	230V026M01				
L3	1st. IF	235V014M01			9C1	
L4	2nd. IF	235V014M01			9C1	
L5	3rd. IF	235V014M02			9C2	

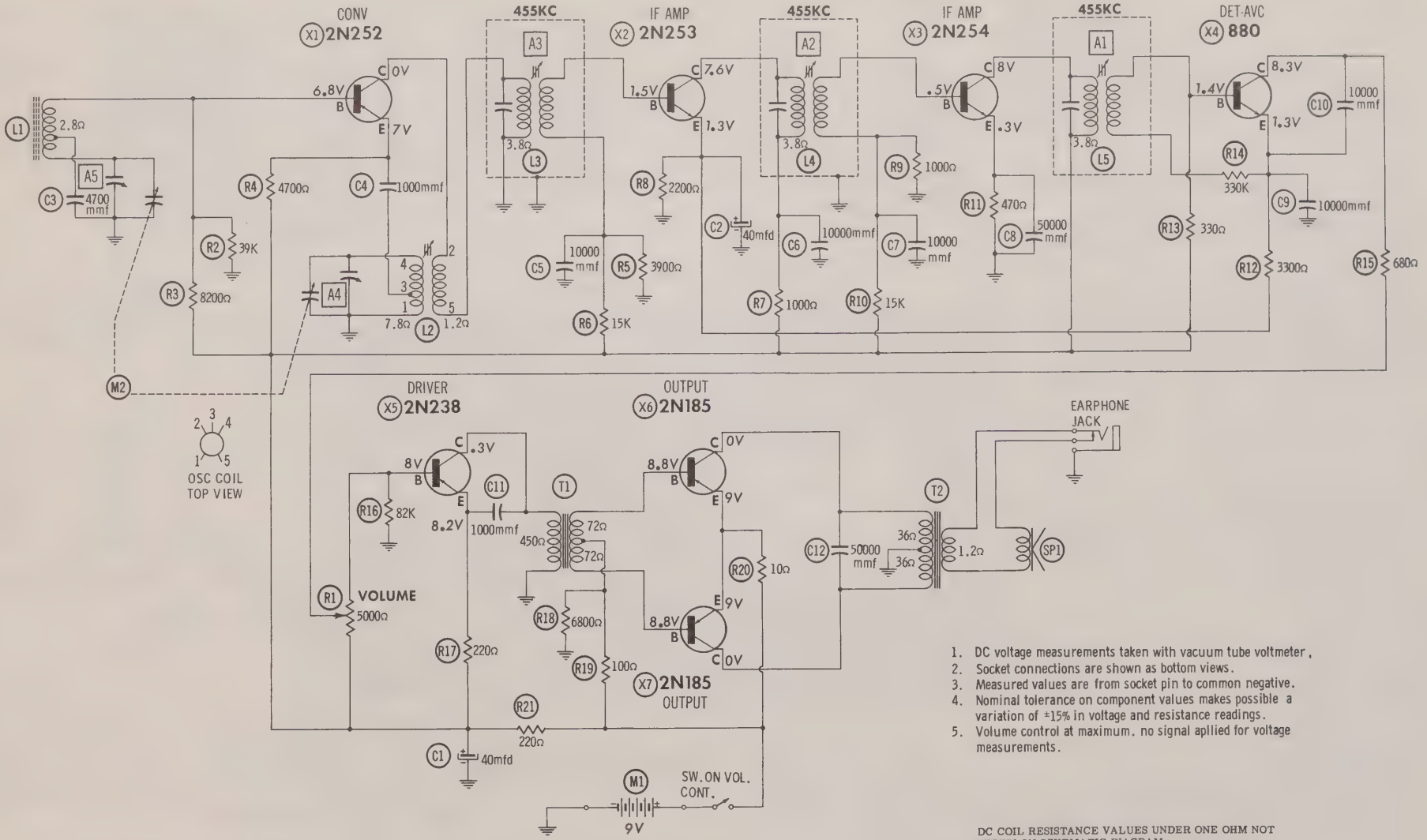
BATTERIES

ITEM No.	VOLTAGE	Westinghouse PART No.	REPLACEMENT DATA								NOTES
			BURGESS		EVEREADY		MALLORY		RAY-O-VAC		
			"A"	"B"	"A"	"B"	"A"	"B"	"A"	"B"	
M1	9V			P6		226		M-1600		1600	

MISCELLANEOUS

ITEM No.	PART NAME	Westinghouse PART No.	NOTES
M2	Tuning Cap.	330V005M01	Two Gang (23-135MMF, 30-95MMF)
	Printed Board	V-2278-3	
	Phone Jack	754V008M01	
	Knob	550V016M01	Dial
	Knob	550V017M01	On-Off-Volume
	Screw	761V804M01	Dial Knob
	Screw	761V803M01	Cabinet Back
	Cabinet	513V006M01	Model H-617P7, H-587P7A
	Cabinet	513V006M02	Model H-618P7, H-588P7A
	Cabinet	513V006M03	Model H-619P7, H-589P7A
	Back Cover	V-19021-1	Model H-617P7, H-587P7A
	Back Cover	V-19021-2	Model H-618P7, H-588P7A
	Back Cover	V-19021-3	Model H-619P7, H-589P7A
	Case	513V008M01	Leather
	Connector Ass'y.	754V007M01	Battery, Positive Terminal

WESTINGHOUSE MODEL H-587P7A (Ch. V-2278-3)



1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum. no signal apllied for voltage measurements.

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

RESISTANCE READINGS NOT TAKEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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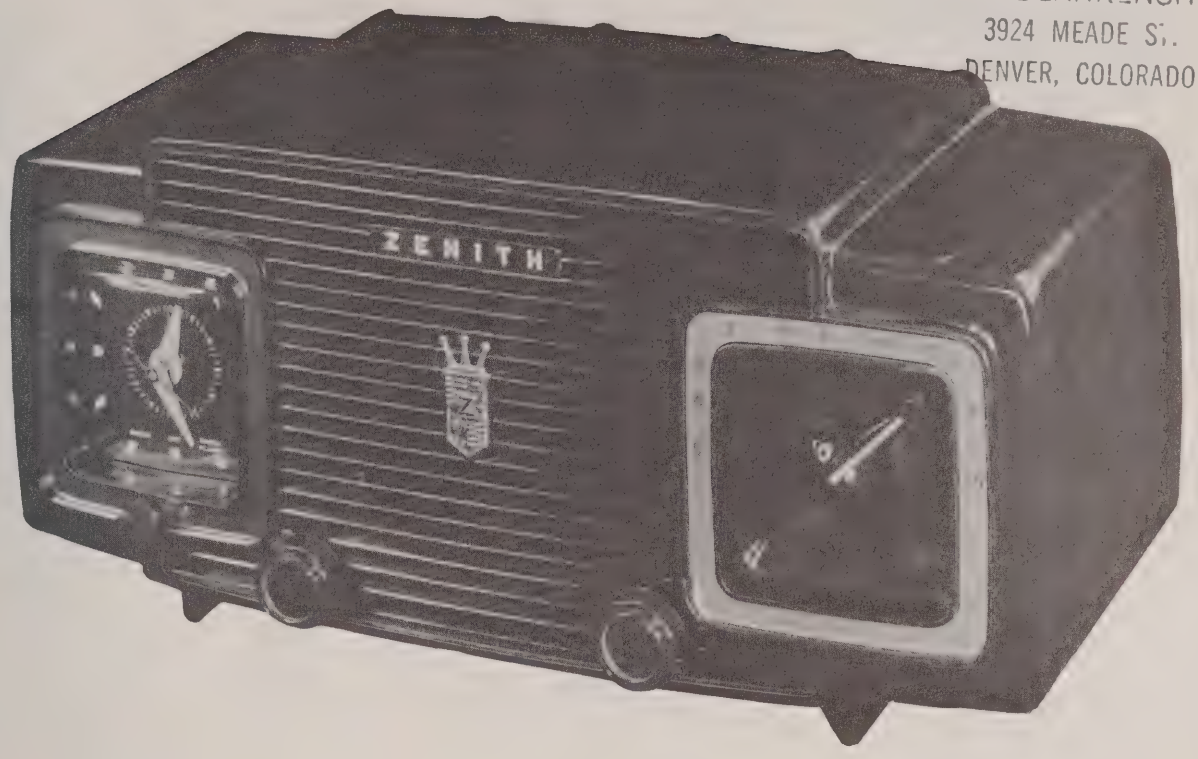
ZENITH
MODELS Z515, W, Y (Ch. 5Z06)



ZENITH
MODELS Z515, W, Y (Ch. 5Z06)

TRADE NAME	Zenith Models Z515, Z515W, Z515Y (CH. 5Z06)
MANUFACTURER	Zenith Radio Corp., 6001 Dickens Ave., Chicago 39, Ill.
TYPE SET	AC Operated AM Receiver With Electric Clock
TUBES (Five)	Type 12BE6 Converter, 12BA6 IF Amplifier, 12AT6 Det.-AVC-AF Amp., 50C5 Cutput, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycles — RATING .29Amp. @ 117 Volts AC (28 Watts Without Clock)
TUNING RANGE—BROADCAST	535 KC - 1620 KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in the same relative position to chassis as when the receiver is in cabinet.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.
To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.5MFD	High side to pin 7 (grid) of 12BE6(V1). Low side to B-.	455KC (400~Mod)	600KC	Across Voice coil	A1, A2 A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2		Loop	1600KC	1600KC	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3		"	1400KC	1400KC	"	A6	"

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1957 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under international Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

PARTS LIST AND DESCRIPTIONS

ZENITH
MODEL Z515 (Ch. 5Z06)

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Converter	12BE6	
V2	IF Amplifier	12BA6	
V3	Det. -AVC-AF Amplifier	12AT6	

ITEM No.	USE	TYPE	NOTES
V4	Output	50C5	
V5	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	ZENITH PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	■80	150	22-2351	AFH2-19	B0180	FP216	TMD-16	D-085	TVL-3443
B	▲40	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	ZENITH PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	100		22-5	BPD-0001	DD-101	L10T1	ED-100	UC-531	5GA-T1	
C3	10000		22-3	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C4	. 047	200	22-2792	BPD-05	DF-503	CUB2S47		GEM-4147	2TM-S47	
C5	470		22-6	BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	5GA-T47	
C6	10000		22-3	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C7	10000		22-3	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C8	10000		22-3	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C9	. 047	200	22-2792	BPD-05	DF-503	CUB2S47		GEM-4147	2TM-S47	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	ZENITH PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500K	½	63-2393	B-59	A47-500K-S	Q11-133	U50	Volume
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

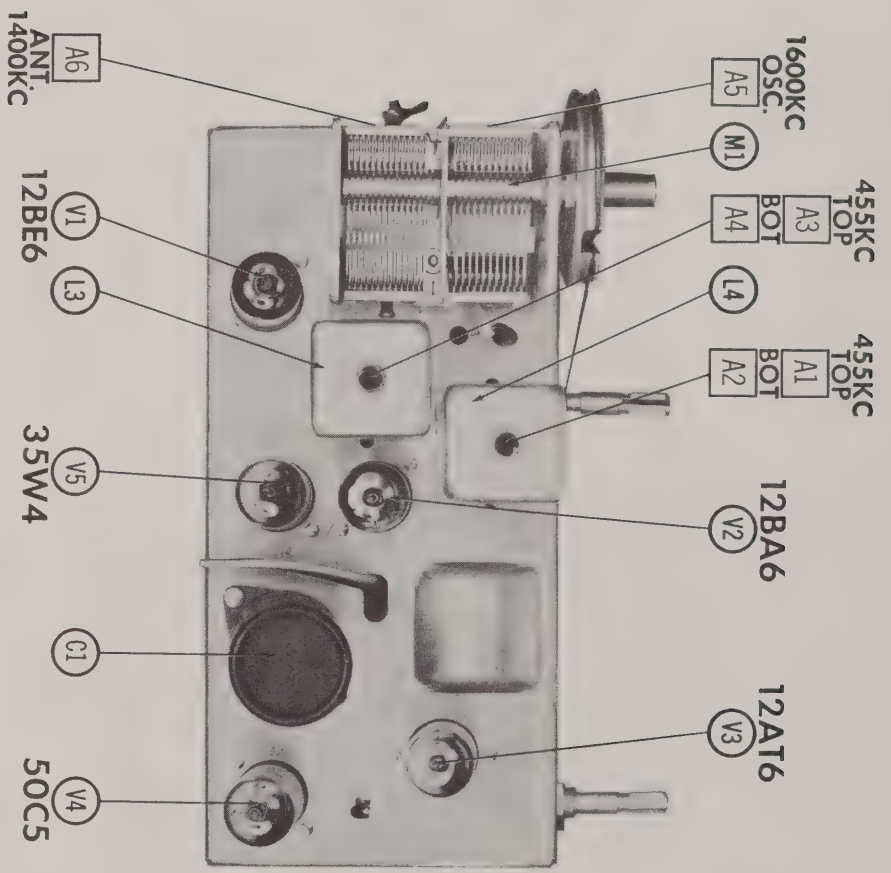
ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	ZENITH PART No.	IRC PART No.	
R2	22K			BTS-22K	
R3	100Ω			BTS-100	
R4	4. 7Meg			BTS-4. 7Meg	
R5	2. 2Meg			BTS-2. 2Meg	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	ZENITH PART No.	IRC PART No.	
R6	470K			BTS-470K	
R7	470K			BTS-470K	
R8	150Ω			BTS-150	
R9	1000Ω	1	63-965	BTA-1000	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	ZENITH PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2300Ω Tapped	3-4Ω	95-1354	Z1102 ①	A-3031①	A-3332 ①	24S50A ①	S-16X①	① Drill One Mounting Hole

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

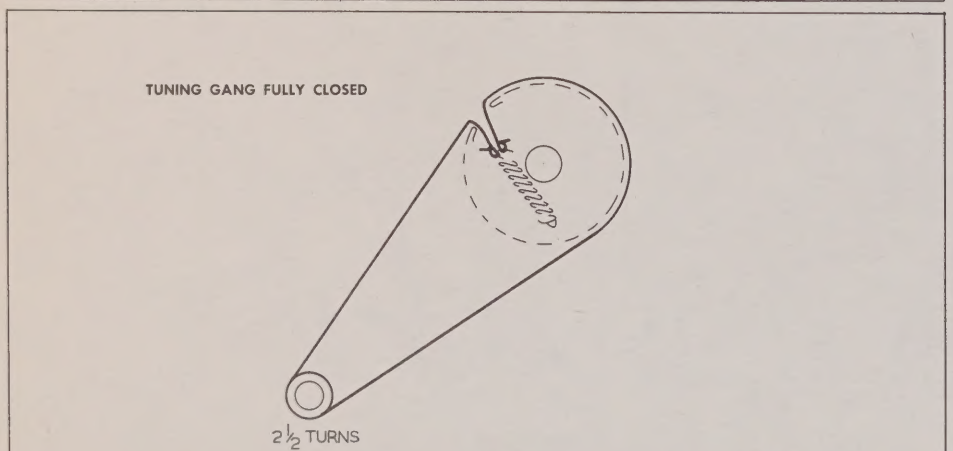
ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	ZENITH PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	49-713	4A07	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		ZENITH PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Ant.	S-40152				Includes Cabinet Back
L2	Osc. Coil	S-20686				
L3	Input IF	95-1101	16-6666	BC-368	012-C1	
L4	Output IF	95-1102	16-6770 *	BC-355 *	12-C6 *	* Use Adaptor Plate

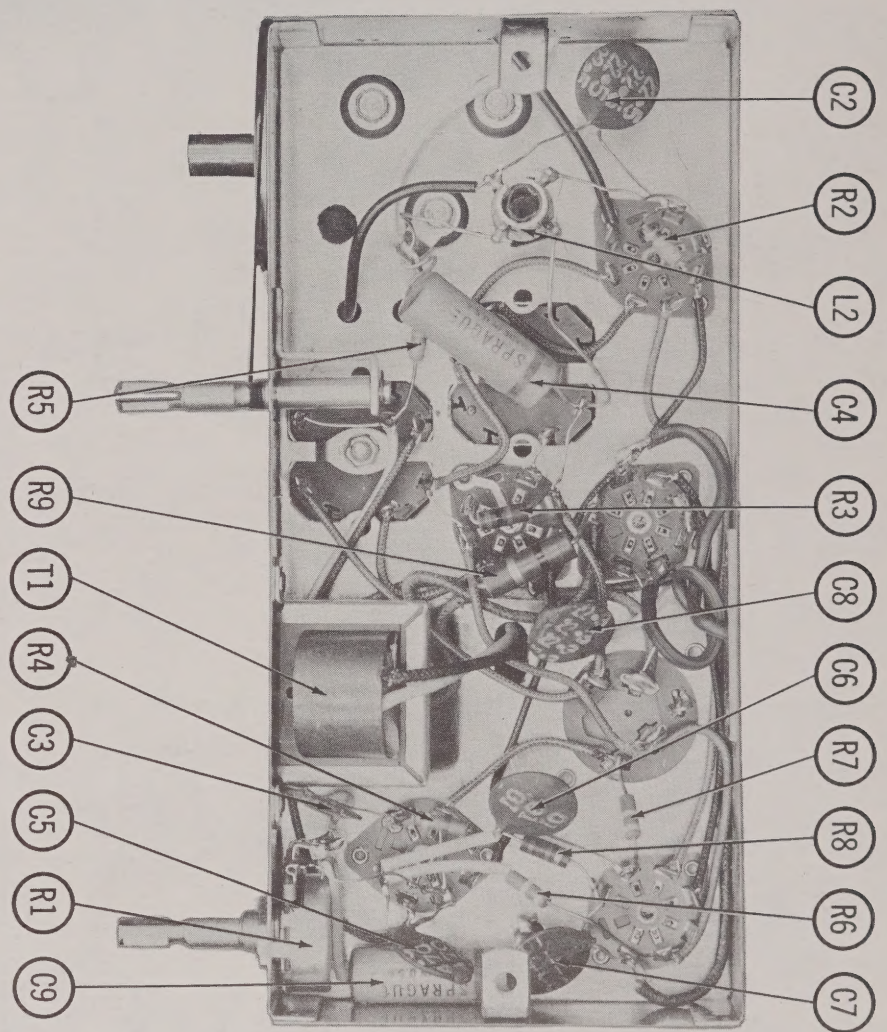
MISCELLANEOUS

ITEM No.	PART NAME	ZENITH PART No.	NOTES
M1	Tuning Cap.	22- 2386	2 Gang (37-457MMF, 27-195MMF)
M2	Clock Assy.	S-40150	Model Z515
	Clock Assy.	S-40203	Model Z515Y
	Clock Assy.	S-40204	Model Z515W
	Crystal	192-155	
	Dial Scale	26-480	Radio
	Dial Scale	26-561	Clock
	Pointer	59-280	Model Z515
	Pointer	59-281	Model Z515W
	Pointer	59-282	Model Z515Y
	Knob	46-1222	Volume, Tuning, Model Z515
	Knob	46-1224	Volume, Tuning, Model Z515W
	Knob	46-1262	Volume, Tuning, Model Z515Y
	Knob	46-1618	Auto-On-Off, Model Z515
	Knob	46-1619	Auto-On-Off, Model Z515Y
	Knob	46-1620	Auto-On-Off, Model Z515W
	Cabinet	14-2073	Model Z515
	Cabinet	14-2074	Model Z515Y
	Cabinet	14-2075	Model Z515W

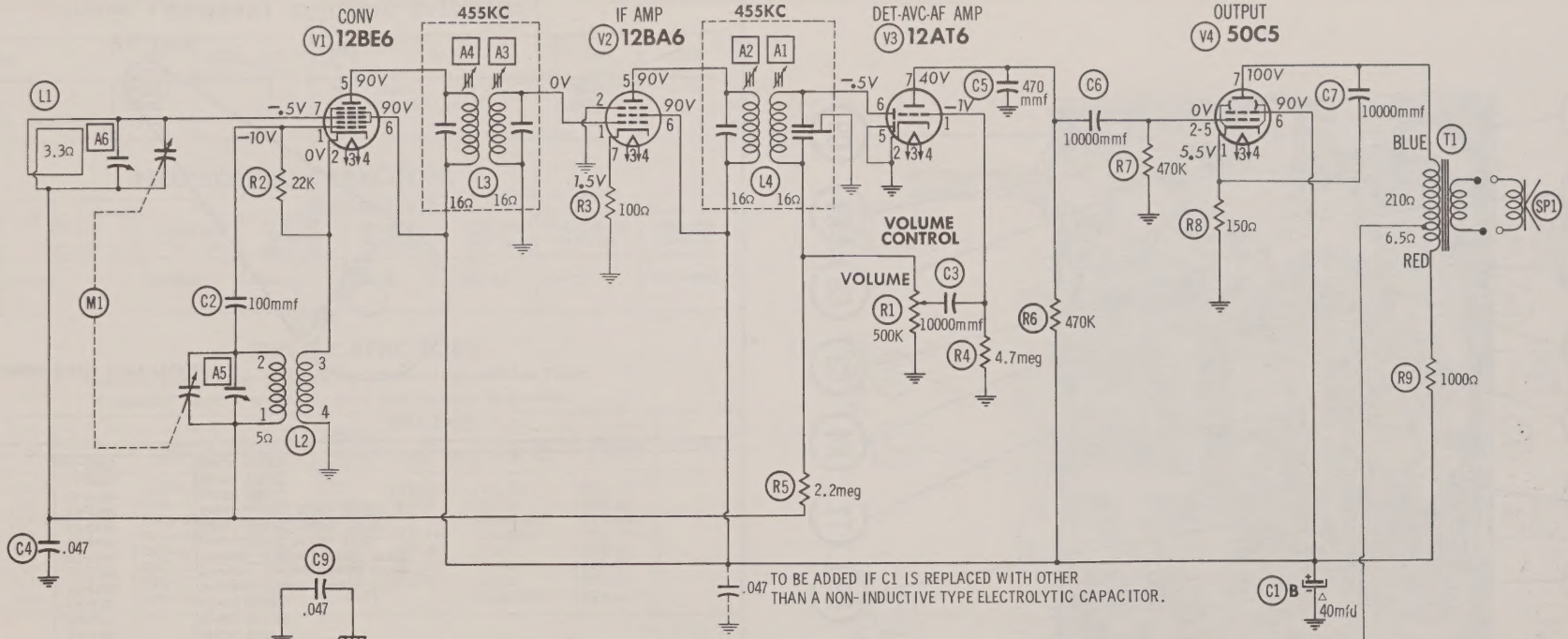


DIAL CORD STRINGING

CHASSIS—BOTTOM VIEW



ZENITH
MODEL Z515 (Ch. 5Z06)



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to commom negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BE6	22K	.6Ω	24Ω	36Ω	†1000Ω	†1000Ω	2.7Meg
V2	12BA6	16Ω	0Ω	12Ω	24Ω	†1000Ω	†1000Ω	100Ω
V3	12AT6	4.7Meg	0Ω	0Ω	12Ω	0Ω	500K	†470K
V4	50C5	150Ω	470K	36Ω	85Ω	470K	†1000Ω	†210Ω
V5	35W4	TP	TP	85Ω	120Ω	120Ω	115Ω	20K(Min)

† MEASURED FROM PIN 7 OF V5.

THROUGH CAMS AND LINKAGES, ONE SW. PERFORMS ALL FUNCTIONS OF OFF, ON, AUTO, AND SLEEP

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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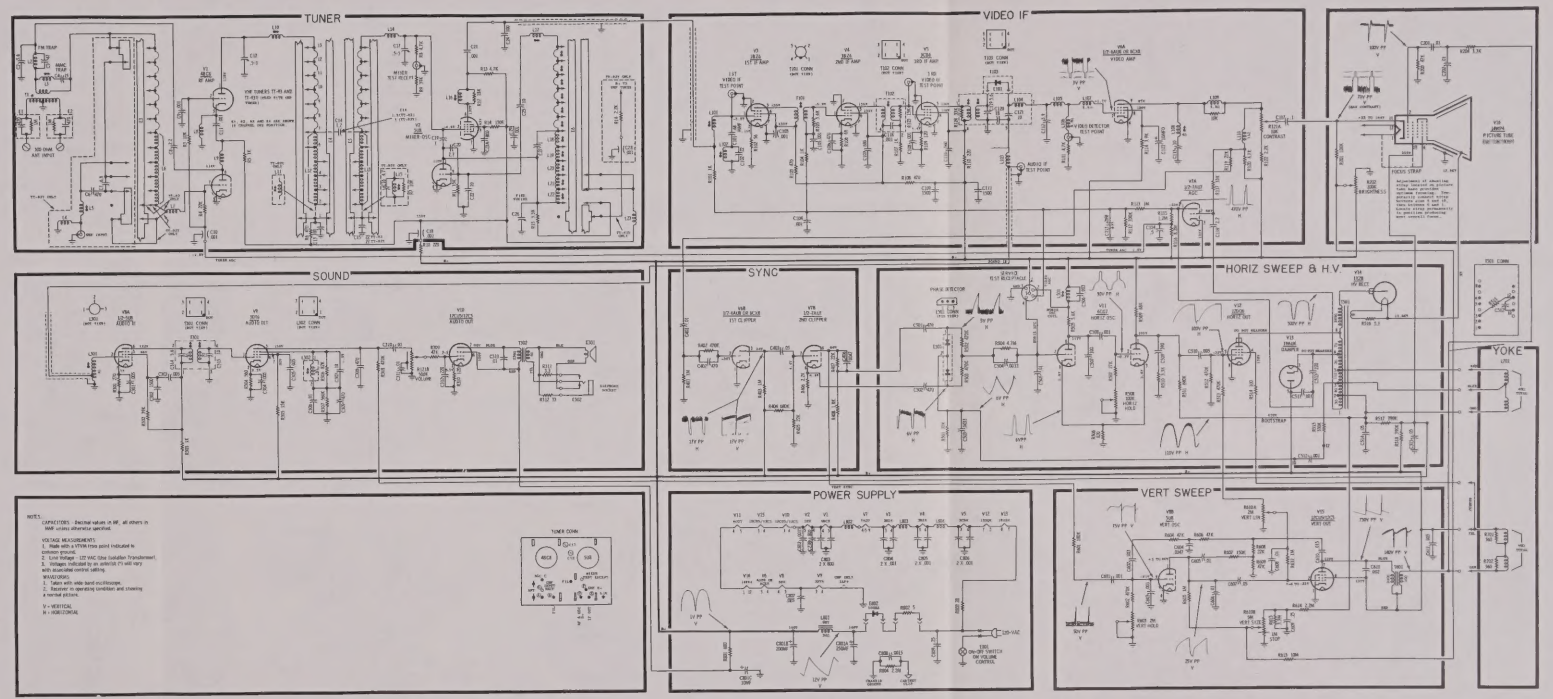
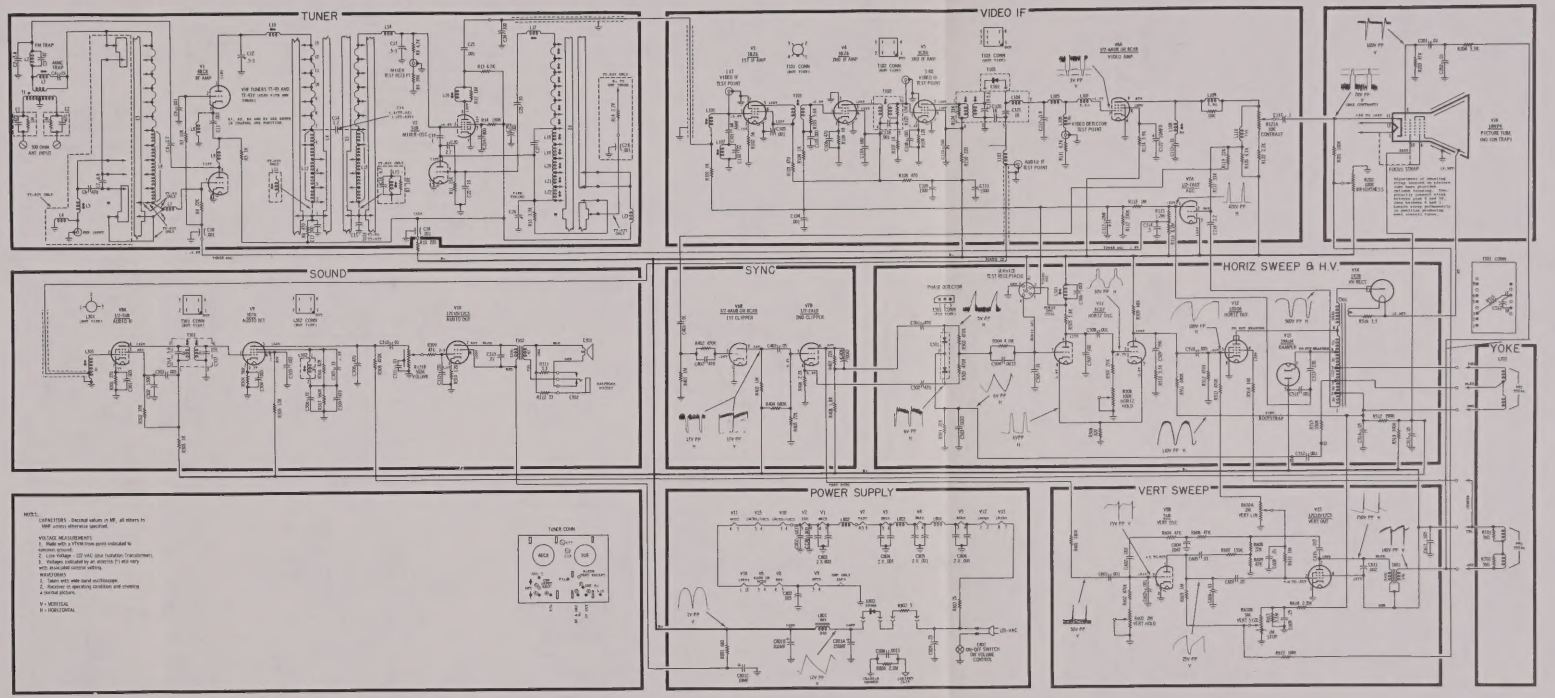


MOTOROLA MODELS	CHASSIS
Y14P10-1	TS-425Y
Y14P10-2	"
Y14P11-1	"
Y14P11-2	"
14P10-1	TS-425
14P10-2	"
14P11-1	"
14P11-2	"

SCHEMATIC COURTESY OF MOTOROLA INC.



MOTOROLA MODELS	CHASSIS
Y14P10-1	TS-425Y
Y14P10-2	"
Y14P11-1	"
Y14P11-2	"
14P10-1	TS-425
14P10-2	"
14P11-1	"
14P11-2	"

SCHEMATIC COURTESY OF MOTOROLA INC.